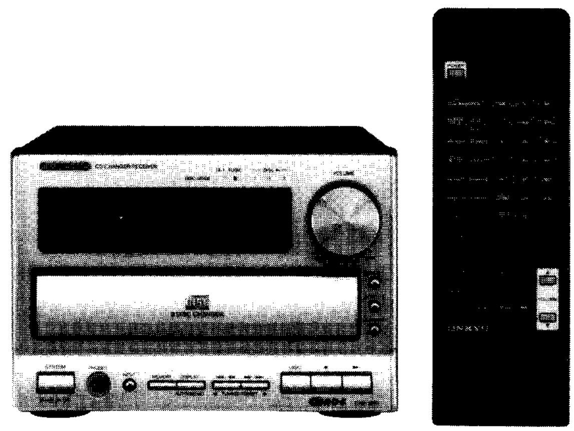
Ref. No.3608

ONKYO® SERVICE MANUAL

CD CHANGER RECEIVER

MODEL CHR-185X



Silver models

UP	230V AC, 50Hz
UD	120V AC, 60Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

ONKYO®
AUDIO COMPONENTS

TABLE OF CONTENTS

SPECIFICATIONS

AMP SECTION

Power Output:	
US model:	**20 watts per channel min. RMS into 4 ohms both channel driven at 1 kHz no more than 0.2% total harmonic distortion**
Other models:	2 x 20 watts at 4 ohms 1 kHz DIN 2 x 15 watts at 8 ohms 1 kHz DIN 2 x 25 watts at 4 ohms EIAJ
Dynamic Power:	2 x 24 watts at 4 ohms 2 x 18 watts at 8 ohms
Total Harmonic Distortion:	0.2 % at rated power
IM Distortion:	0.2 % at rated power
Damping Factor:	40 at 8 ohms
Sensitivity and Impedance:	TAPE / MD PLAY : 150 mV, 50 kohms LINE IN : 150 mV, 50 kohms
Frequency Response:	10 to 50,000 Hz : +0 / –3dB
Tone Control:	Super BASS : + 9.5 dB at 55 Hz BASS : ± 10 dB at 100 Hz TREBLE : ± 10 dB at 10,000 Hz
Single–to–Noise Ratio:	TAPE : 100 dB (IHF A)
Muting	–∞ dB

FM Tuner section

Tuning Range:	
US model:	87.9 to 107.9 MHz (200 kHz steps)
Other models:	87.50 to 108,00 MHz (50 kHz steps)
Usable Sensitivity:	Mono 12.8 dBf, 1.2 µV (75 ohms IHF) 1.0 µV (75 ohms DIN) Stereo 18.0 dBf, 2.2 µV (75 ohms IHF) 25.0 µV (75 ohms DIN)
50 dB Quieting Sensivity:	Mono 18.8 dBf, 2.4 µV (75 ohms) Stereo 38.8 dBf, 24.0 µV (75 ohms)
Capture Ratio:	2.0 dB
Image Rejection Ratio:	US model: 40 dB Other models: 85 dB
IF Rejection Ratio:	90 dB
Signal–to–Noise Ratio:	Mono 73 dB, IHF Stereo 67 dB, IHF
Selectivity:	
US model:	55 dB
Other models:	50 dB DIN (+ / – 300 kHz at 40 kHz devi.)
Harmonic Distortion:	Mono 1.0 % Stereo 1.5 %
Frequency Response:	30 to 15,000 Hz (+ / – 1.5 dB)
Stereo Separation:	35 dB at 1.000 Hz 25 dB at 100 to 10,000 Hz
Stereo Threshold:	FM : 17.2 dBf, 2.0 µV (75 ohms)

CD SECTION

Signal Readout System:	Optical non–contact
Reading Rotation:	About 500 – 200 r.p.m. (constant linear velocity)
Linear Velocity:	1.2 – 1.4 m / s
Error Correction System:	Cross Interleave Read Solomon code
D / A Converter:	1 bit
Digital Filter:	352.8 kHz 8 times over sampling
Number of Channels:	2 (stereo)
Frequency Response:	5 Hz – 20 kHz

General

Power Supply:	AC 230 V, 50 Hz AC 120 V, 60 Hz
Power Consumption:	55 W
Dimensions:	185 W x 131 H x 378 D mm (7-5/16" x 5-3/16" x 14-7/8")
Weight:	5.0 kg (11.0 lbs)

Specifications and features are subject to change without notice.

CAUTION ON REPLACEMENT OF OPTIONAL PICKUP

The laser diode in the optical pickup block is so sensitive to static electricity, surge current and etc, that the components are liable to be broken down or its reliability remarkably deteriorated.

PRECAUTIONS

During repair, carefulley take the following precautions.
(The following precautions are included in the service parts.)

1.Ground for the work-desk.
Place a conductive sheet such as a sheet of copper (witch inpedance lower than 10MΩ) on the work-desk and place the set on the conductive sheet so that the chassis.

2.Grounding for the test equipment and tools.
Test equipment and toolings should be grounded in order that their ground level is the same the ground of the power source.

3.Grounding for the human body.
Be sure to put on a wrist-strap for grounding whose other end is grounded.
Be particulary carful when the workers wear synthetic fiber clothes, or air is dry.

4.Select a soldering iron that permits no leakage and have the tip of the iron well- grounded.

5.Do not check the laser diode terminals with the probe of a circuit tester or osilloscope.

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

WARNING !!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYES TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

Laser Diode Properties

- Material: GaAlAs
- Wavelength: 760-800nm
- Emission Duration: continuous
- Laser output: max. 0.5mW*

* This output is the value measure at a distance about 1.8mm from the objective lens surface on the Optical pick-up Block.

LASER WARNING LABELS

There labels are located on the mechanism.

1. **Warning lable**
   This label is located on the chassis.

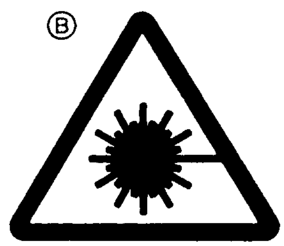
Ⓐ

DANGER —INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK FAILED OR DEFEATED. AVOID DIRECT EXPOSURE TO BEAM.

CAUTION —HAZARDOUS LASER AND ELECTROMAGNETIC RADIATION WHEN OPEN AND INTERLOCK DEFEATED.

ATTENTION —RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT AVEC L ECLENCHEMENT DE SECURITE ANNULE.

Ⓑ



2. **Class 1 label**
   This label is located on the left side of top cover.

"CLASS 1 LASER PRODUCT"

LUOKAN 1
LASERLAITE

KLASS 1
LASER APPARAT

SERVICE PROCEDURES

1. Replacing the fuses

This symbol located near the fuse indicates that the fuse used is fast operating type. For continued protection against fire hazard, replace with same type fuse. For fuse rating refer to the marking adjacent to the symbol.

Ce symbole indique que le fusible utlise est a rapide. Pour une protection permanente, n'utiliser que des fusibles de meme type. Ce darnier est indique la qu le present symbol est appose.

Circuit No.	Part No.	Description
F901	252083	0.4A-SE-EAWK,Fuse <P>
F901	252158	1.6A-UL/T-237, Fuse <D>

NOTE: <P> 230V model only
<D> 120V model only

2. To Initialize the unit

This device employs a microprocessor to perform various functions and operations. If interference generated by an external. power supply, radio wave, or other electrical source results in accident which causes the specified operations and functions to operate abnormally.

To perform a result, please follow the procedure below.

1. **Press and hold down the DOWN (▼) button, then press the DISC-3 (OPEN/CLOSE) button.**
2. **Press the POWER button.**
3. **After "clear" is displayed, the prest memory and each mode stored in the memory, are initialized and will return to the factory settings.**

3. Safety-check out

After correcting the original service problem, perform the following safety check before releasing the set to the customer. Connect the insulating-resistance tester between the plug of power supply cord and the screw on the back panel.

Specifications: More than 10 MΩ at 500V.

4. Memory preservation

This unit does not require memory preservation batteries.

A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged.

The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory, the power switch must be turned on and off a few times each month the keep the back-up system operative.

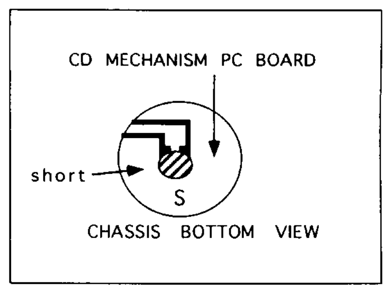
The period of the time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorted when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

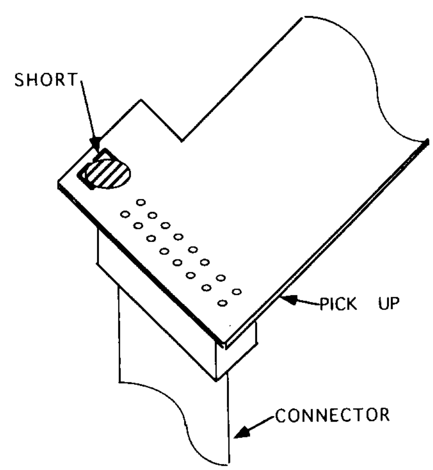
CAUTION ON REPLACEMENT OF OPTICAL PICKUP

The laser diode in the optical pickup block is so sensitive to static electricity, surge current and etc. that the components are liable to be broken down or its reliability remarkably deteriorated.

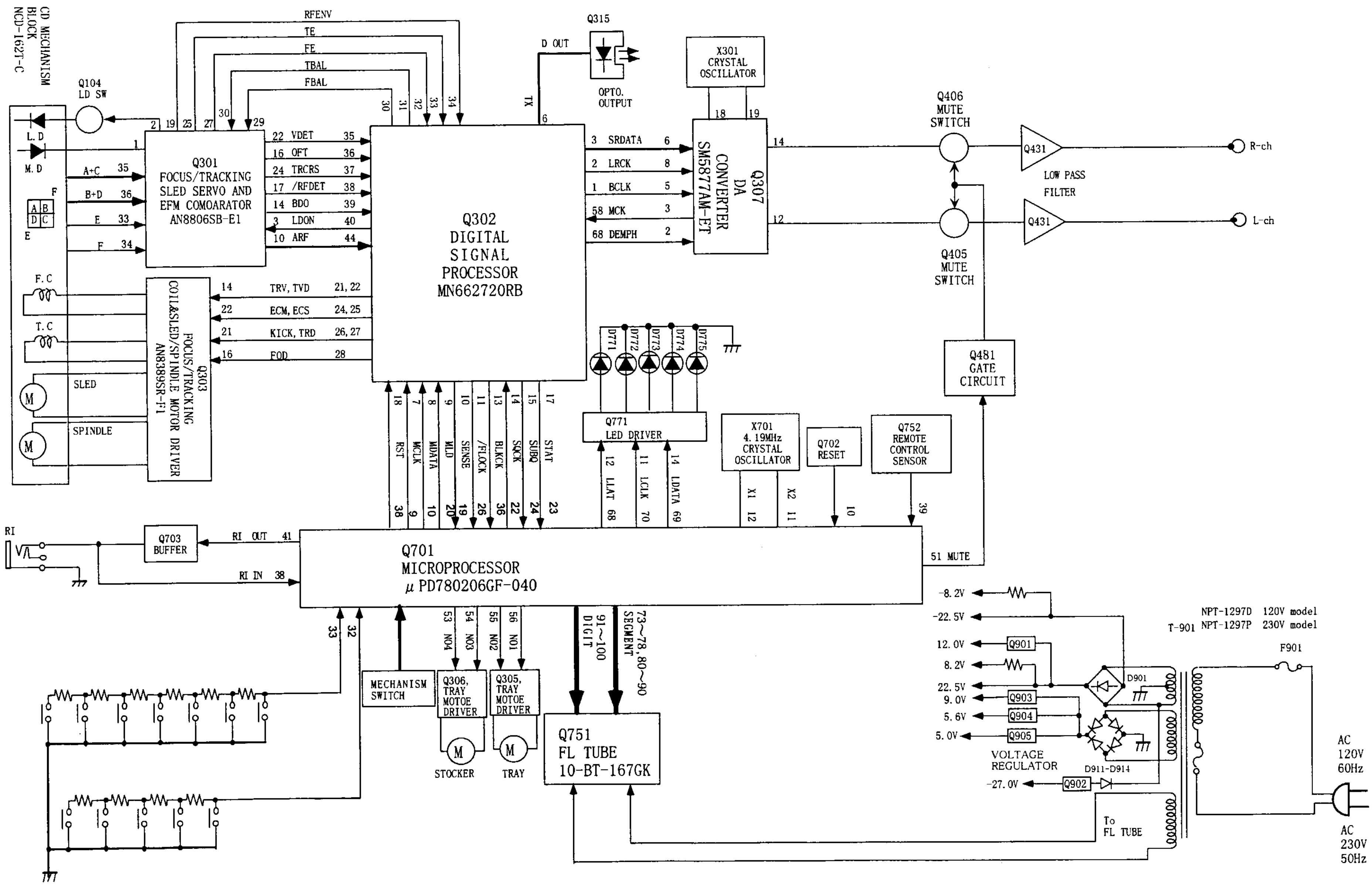
During repair, carefully take the following precautions.

1. When replacing the CD mechanism assembly, first short the pattern on the CD mechanism pc board and remove the connector (P301).
2. When replacing the optical pickup, first short the LD terminals and remove the connector. Also, when attaching the new optical pickup, after attaching the connector, unsolder the LD terminals.
3. Do not touch the optical object lens with the hands.

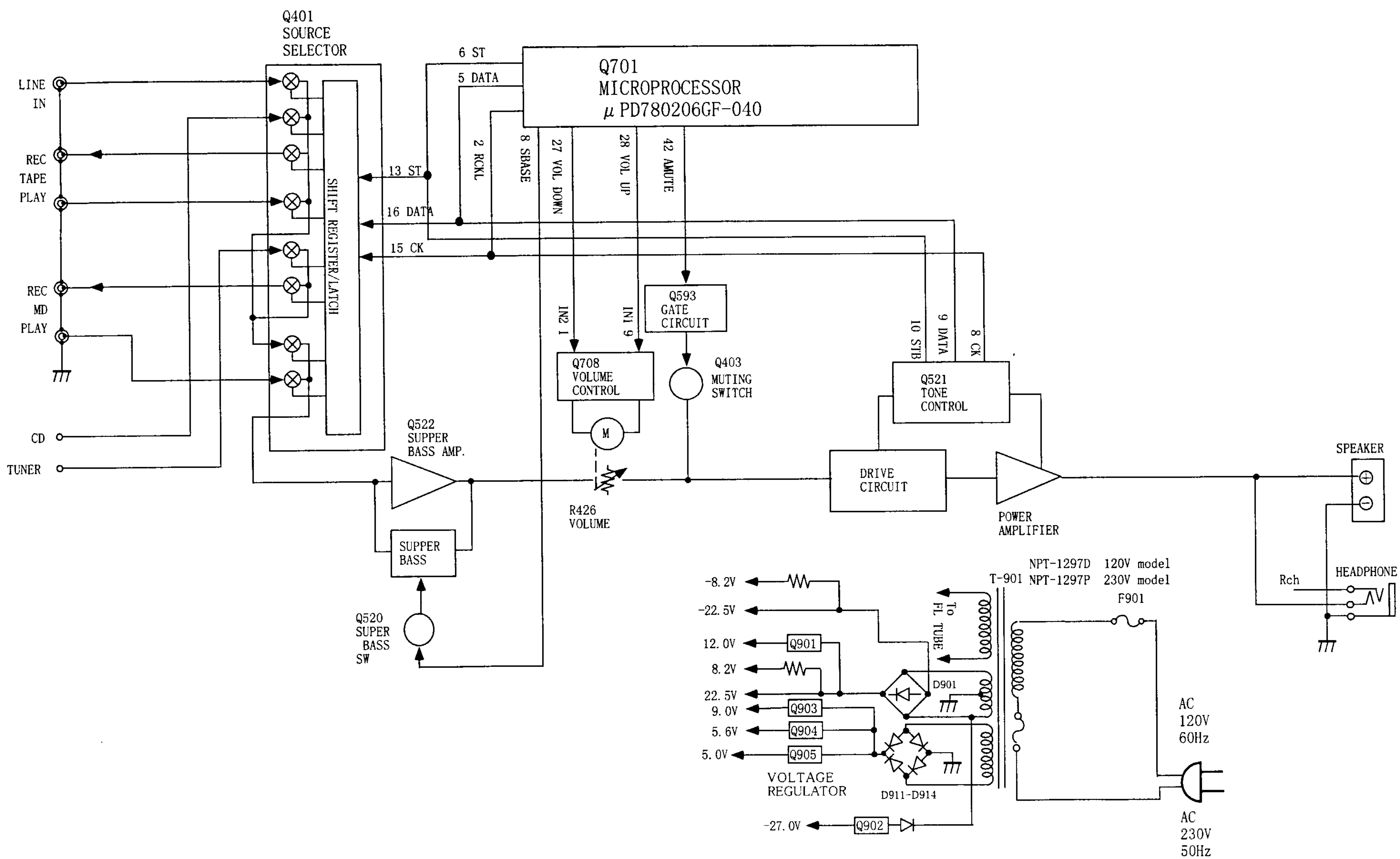




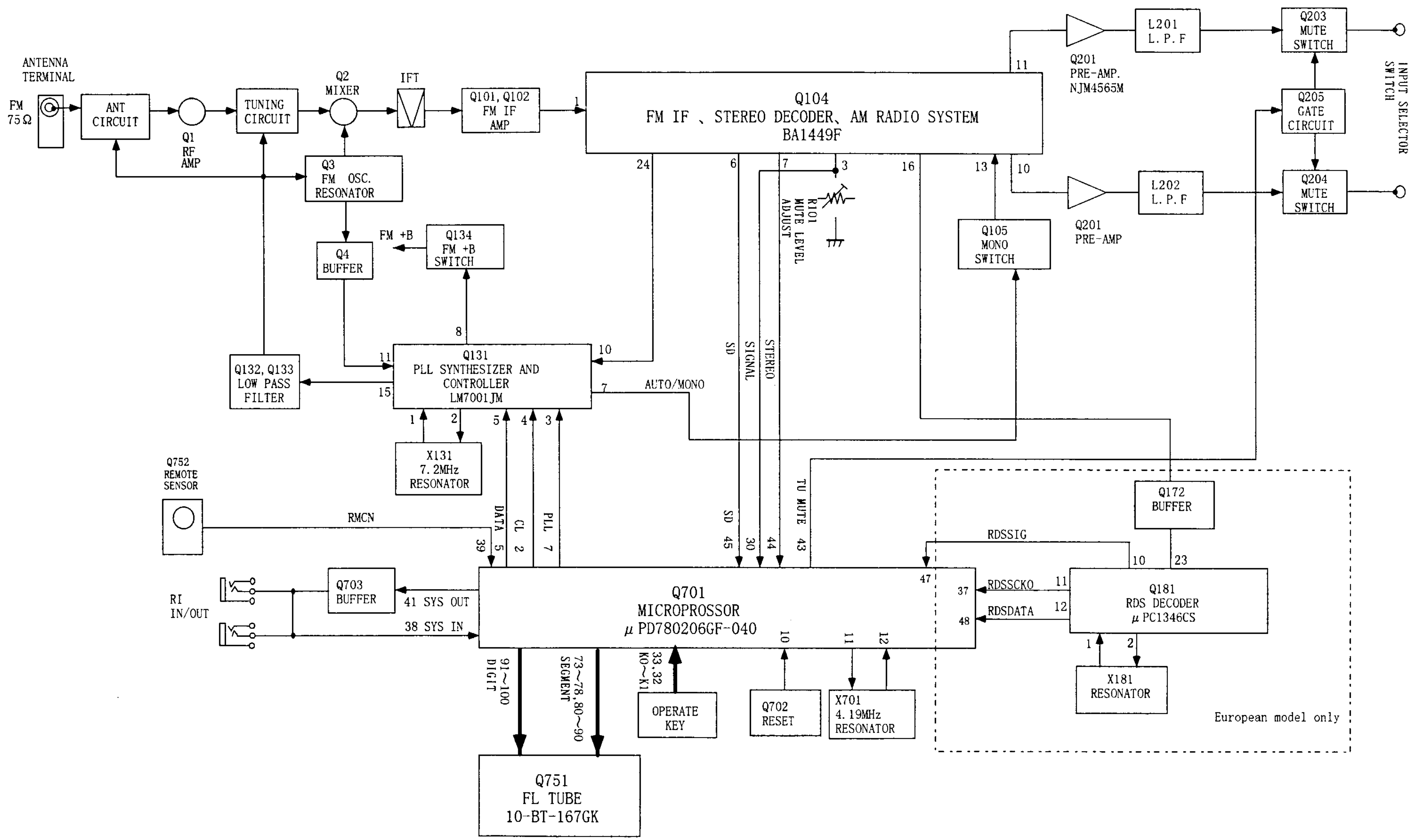
BLOCK DIAGRAM(CD SECTION)



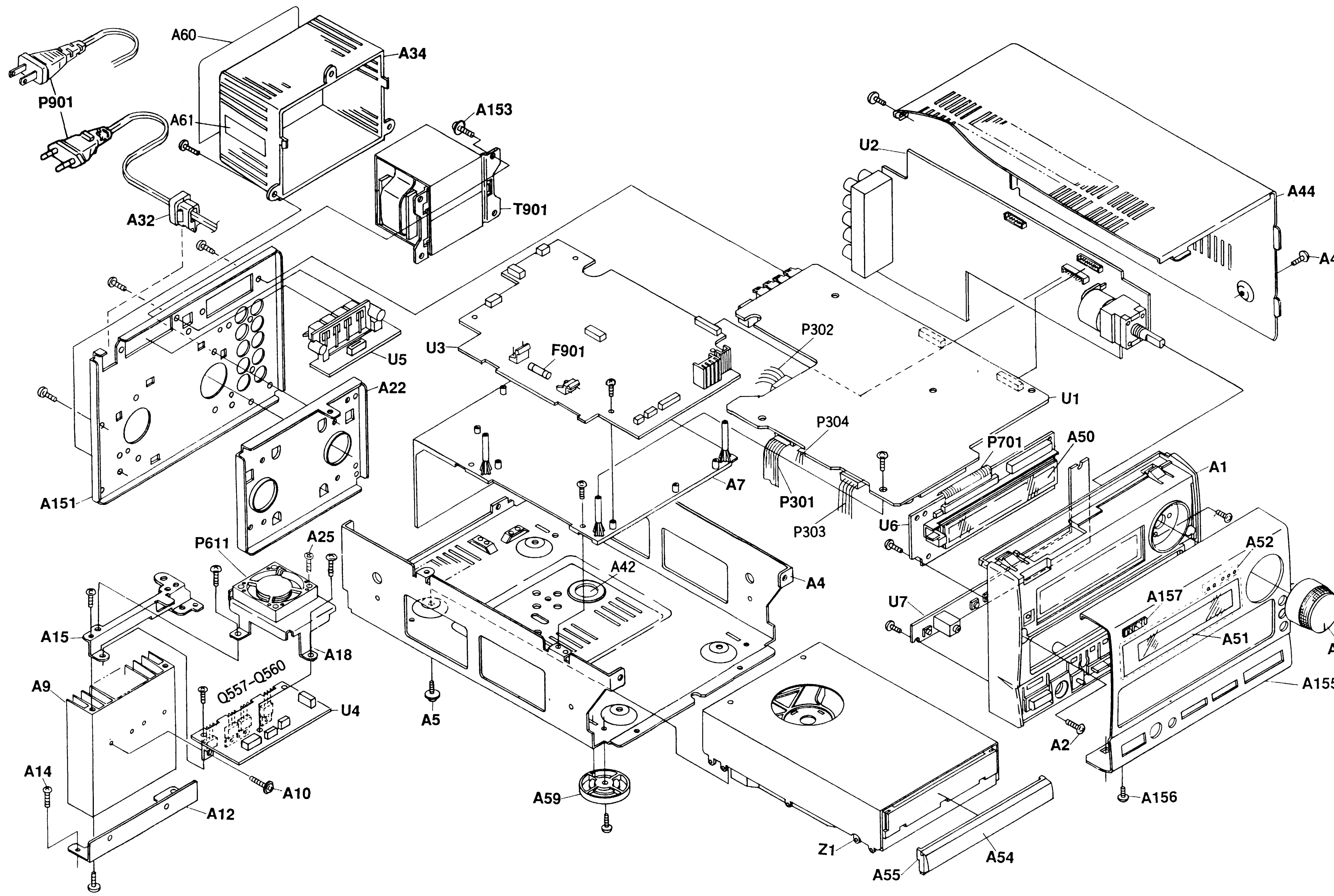
BLOCK DIAGRAM(AMP SECTION)



BLOCK DIAGRAM(TUNER SECTION)



CHASSIS EXPLODED VIEW



CHASSIS EXPLODED VIEW PARTS LIST

REF. NO.	PART NO.		DESCRIPTION
A1	27110982A		Front bracket
A2	838130088		3TTB+8B,Self-tapping screw
A4	27100326		Chassis
A5	831430088		3TTW+8B(BC),Self-tapping screw
A6	28140835		Cushion
A7	27190997		Holder, mechanism
A9	27160382		RAD-109,Radiator
A10	801433		3SMS8W.SW+14B(BC),Special screw
A12	27141675		Retainer, heat sink
A14	834430068		3TTS+6B(BC),Self-tapping screw
A15	27141676		Retainer, heat sink
A18	27141677		Retainer, fuse
A22	27130787B		Bracket
A25	838430107		3TTB+10S(BC),Self-tapping screw
A32	27300750	⚠	Bushing, cord
A34	28184677		Cover, transformer
A42	27262600		Plate S
A44	28184678Z		Top cover
A45	838230088		3TTB+8B(NI), Nickel screw
A50	28133362		Back plate
A51	28191773A		Clear plate
A52	28198860		Facet
A54	27301918		Door
A55	27301920		Base, door
A57	28325612		Knob, Volume
A59	27175252-1B		Leg
A60	29362355		Label, rating <P>
A60	29362377		Label, rating <D>
A149	29095846		Sheet, power transformer <D>
A150	27270422		Spacer PT <D>
A151	27122316		Rear panel <P>
A151	27122316		Rear panel <D>
A153	830440089		4TTC+8C(BC),Self-tapping screw
A153	830440089		4TTC+8C(BC),Self-tapping screw
A154	29362285		Label, caution
A155	27212047		Front panel <P>
A155	27212056		Front panel <D>
A156	801525		3TTB+8B(BC),Self-tapping screw
A157	28135247		Badge <P>
A158	29360626-1		Label, fuse <D>

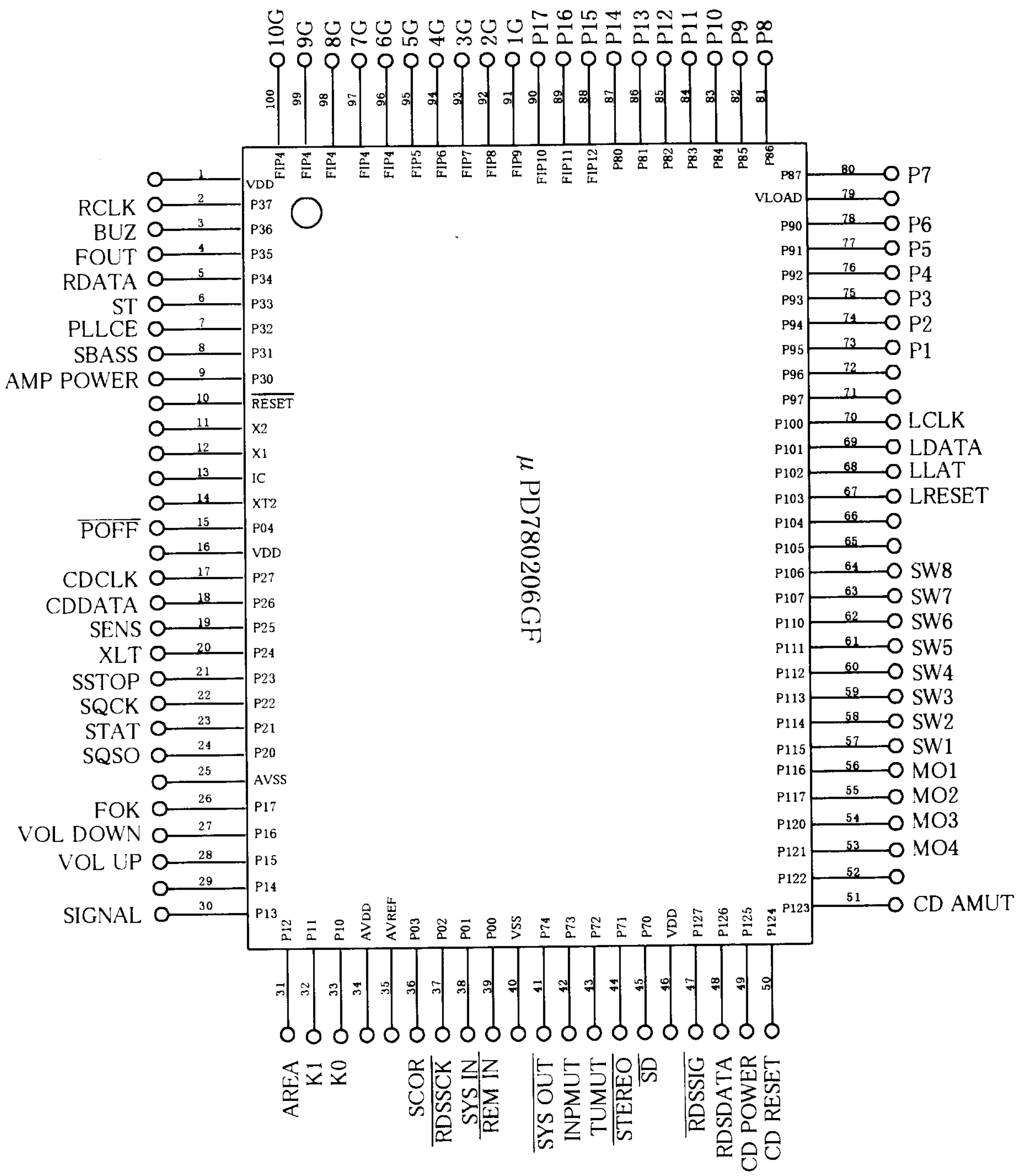
REF. NO.	PART NO.		DESCRIPTION
E852	838430107		3TTB+10S(BC), Special screw
F901	252083	⚠	0.4A-SE-EAWK,Fuse <P>
F901	252158	⚠	1.6A-UL/T-237, Fuse <D>
P301	2044160062		NCFC4-160062,Flexible flat cable
P302	2002391220		NSAS-12P0593,Socket
P303	2001191830		NSAS-18P0590,Socket
P304	2001190830		NSAS-8P0591,Socket
P611	24502283		D04X-24TL,Fan
P701	2047351012		NCFC7-351012,Flexible flat cable
P901	253193HIT	⚠	AS-CEE,Power supply cord <P>
P901	253277MIL	⚠	AS-UC-2#18,Power supply cord <D>
Q557,Q558	2202063,	*	2SC4511-O,
Q557,Q558	2202064 or	*	2SC4511-Y or
Q557,Q558	2202066	*	2SC4511-P,Transistor
Q559,Q560	2202053,	*	2SA1725-O,
Q559,Q560	2202054 or	*	2SA1725-Y or
Q559,Q560	2202056	*	2SA1725-P,Transistor
T901	2301265A	⚠	NPT-1297P,Power transformer <P>
T901	2301264B	⚠	NPT-1297D,Power transformer <D>
U1	1H391589-2B		NAAR-5989-2B,Main circuit PC board ass'y <P>
U1	1H391589-2C		NAAR-5989-2C,Main circuit PC board ass'y <D>
U2	1H391590-2B		NAAF-5990-2B,Preamplifier PC board ass'y <P>
U2	1H391590-2C		NAAF-5990-2C,Preamplifier PC board ass'y <D>
U3	1H391591-2B		NAAF-5991-2B,Power supply circuit PC board ass'y <P>
U3	1H391591-2C		NAAF-5991-2C,Power supply circuit PC board ass'y <D>
U4	1H391592-2B		NAAF-5992-2B,Power amplifier PC board ass'y <P>
U4	1H391592-2C		NAAF-5992-2C,Power amplifier PC board ass'y <D>
U5	1H391593-2B		NAETC-5993-2B,Speaker terminal PC board ass'y <P>
U5	1H391593-2C		NAETC-5993-2C,Speaker terminal PC board ass'y <D>
U6	1H391594-2B		NADIS-5994-2B,Display circuit PC board ass'y <P>
U6	1H391594-2C		NADIS-5994-2C,Display circuit PC board ass'y <D>
U7	1H391595-2B		NASW-5995-2B,Switch circuit PC board ass'y <P>
U7	1H391595-2C		NASW-5995-2C,Switch circuit PC board ass'y <D>
Z1	24800041		NCD-162T-C,CD mechanism ass'y
Z704	29360687		Label (CLASS1)<P>

CAUTION : **Replacement of the transistor of mark * , if necessary mast be made from the same beta group (HFE) as the original type.**

NOTE : THE COMPONENTS INENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

NOTE : <D>120V model only
<P>230V model only

μPD780206GF-040(Microprocessor)



MICROPROCESSOR TERMINAL DESCRIPTIONS(1/2)

PIN NO.	SYMBOL	FUNCTION	DESCRIPTION
1	VDD	VDD	Power supply terminal. (+5V)
2	P37	RCLK	Connect to CK output terminal of TC9164AN function switch, CL terminal of PLL LM7001 and CK terminal of TC9184P of electronics volume output terminals.
3	P36	BUZ	Buzzer output terminal.
4	P35	FOUT	Clock monitor output terminal. (at all light mode: output)
5	P34	RDATA	Connect to DATA terminal of TC9164AN function switch, DATA terminal of PLL LM7001and DATA terminal of TC9184P electronics volume output terminal.
6	P33	ST	Connect to TC9164AN of function switch, TC9184P STB of electronics volume output terminal.
7	P32	PLLCE	Connect to CE terminal of PLL LM7001 output terminal.
8	P31	SBASS	Super bass control output terminal. (at SBASS ON : "H")
9	P30	AMP POWER	Power supply (POWER) control output terminal. (at POWER ON : "H")
10	RESET	RESET	System reset input terminal. (at active: "L")
11	X2	X2	Main system clock oscillator crystal connect terminal.
12	X1	X1	Connect to 4.19MHz ceramic oscillator.
13	IC	IC	IC terminal. connect to GND.
14	XT2	XT	Sub system clock oscillator crystal connect terminal. (not used)
15	P04	POFF	Power down reset sensor input terminal. (at power down : "2")
16	VDD	VDD	Power supply (+5V) terminal.
17	P27	CDCLK	Connect to MLOK terminal of signal processor IC MN662724RPE.
18	P26	XLT	Connect to MLD terminal of signal processor IC MN662724RPE.
19	P25	CDDATA	Connect to MDATA terminal of signal processor IC MN662724RPE.
20	P24	STAT	Connect to STAT terminal of signal processor IC MN662724RPE.
21	P23	SSTOP	Pick-up inner side sensor of mechanism switch input terminal.
22	P22	SQCK	Connect to SQCK terminal of signal processor IC MN662724RPE.
23	P21	SENS	Connect to SENSE terminal of signal processor IC MN662724RPE.
24	P20	SQSO	Connect to SQBQ terminal of signal processor IC MN662724RPE.
25	AVSS	AVSS	A/D converter ground voltage terminal.
26	P17	FOK	CD mechanism FOK output terminal. (at active: "H")
27	P16	VOL DOWN	Volume up/down control output terminal. (at active : "H")
28	P15	VOL UP	Volume up/down of Remote control code as bellow.

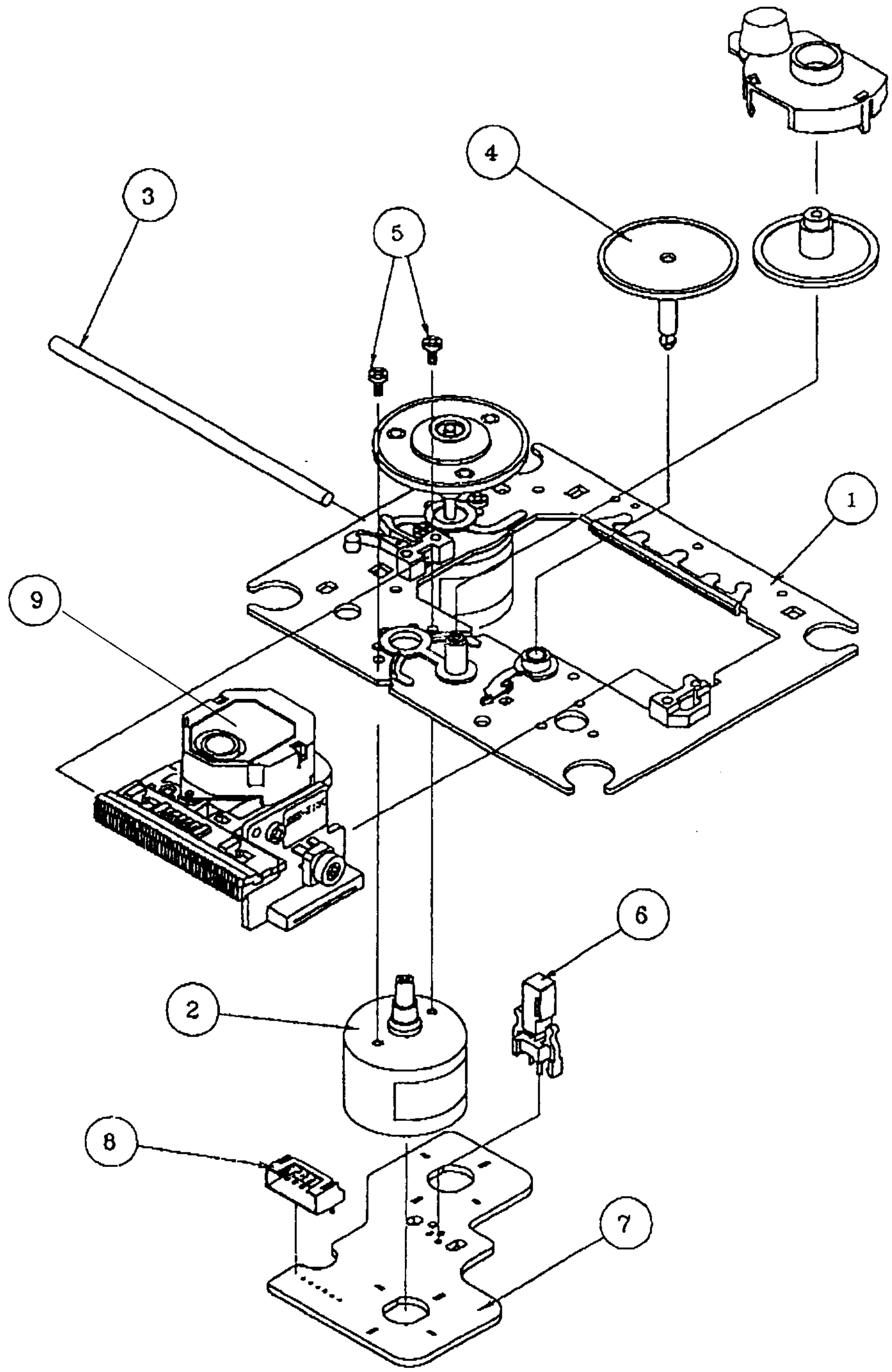
operation	VOL UP output	VOL DOWN output	
stop (brake)	H	H	POWER ON
VOLUME UP	H	L	POWER ON
VOLUME DOWN	L	H	POWER ON
POWER OFF	L	L	

PIN NO.	SYMBOL	FUNCTION	DESCRIPTION
29	P14	not used	not used (at normal: "L")
30	P13	SIGNAL	auto memory signal level input terminal.analog voltage input (8 step)
31	P12	AREA	Initializing setting terminal for the frequency range. (BAND0, BAND1, AK10K)
32	P11	K1	Key input terminal.
33	P10	K0	Key input terminal.

MICROPROCESSOR TERMINAL DESCRIPTIONS(2/2)

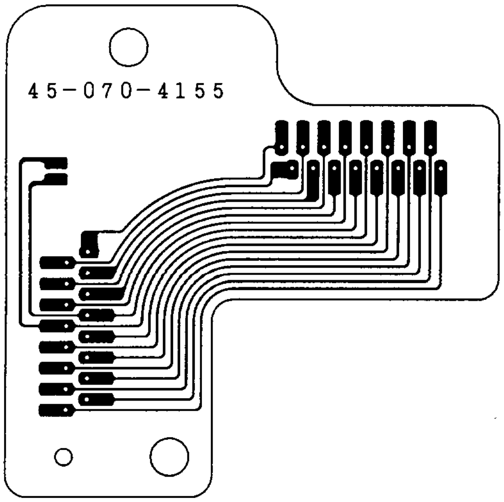
PIN NO.	SYMBOL	FUNCTION	DESCRIPTION
34	AVDD	AVDD	A/D converter analog power supply (+5V) terminal.
35	AVREF	AVREF	A/D converter standard voltage input terminal.
36	P03	SCOR	Connect to BLKCK terminal of signal processor IC MN66272RPE. subcode sensor
37	P02	$\overline{\text{RDSSCK}}$	Connect to CLK out terminal of RDS decoder IC μPC1346CS.
38	P01	SYSIN	System code input terminal. (at active: "H")
39	P00	$\overline{\text{REMIN}}$	Remote control signal input terminal. (at active:"L")
40	VSS	VSS	GND
41	P74	$\overline{\text{SYSOUT}}$	System code output terminal. (at active: "L")
42	P73	INPMUT	Analog muting output terminal. (at active : "H")
43	P72	TUMUT	Tuner muting output terminal. (at active: "H")
44	P71	$\overline{\text{STEREO}}$	Stereo signal detector input terminal. (at stereo: "L")
45	P70	$\overline{\text{SD}}$	Station sensor input terminal. (at station: "L")
46	VDD	VDD	Power supply (+5V) terminal.
47	P127	$\overline{\text{RDSSIG}}$	RDS station detector input terminal. (at RDS station: "L")
48	P126	RDSDATA	Connect to DATA output terminal of RDS decoder IC uPC1346CS.
49	P125	CD POWER	CD mechanism power output terminal. (at active : "H")
50	P124	CD RESET	CD mechanism reset output terminal. (at active : "H")
51	P123	CD AMUT	CD analog muting output terminal. (at active : "H")
52	P122	not used	not used (at normal: "L")
53	P121	M04	CD mechanism motor output terminal.
54	P120	M03	
55	P117	M02	
56	P116	M01	
57-62	P115-P110	SW1-SW6	CD mechanism switch input terminal.
63	P107	SW7	
64	P106	SW8	
65	P105	not used	not used (at normal: "L")
66	P104	not used	not used (at normal: "L")
67	P103	LRESET	LED output terminal. Connect to reset terminal of port expend IC 74HC595.
68	P102	LLAT	LED output terminal. Connect to latch clock terminal of port expend IC 74HC595.
69	P101	LDATA	LED output terminal. Connect to D terminal of port expend IC 74HC595.
70	P100	LCLK	LED output terminal. Connect to SHIFT CLOCK terminal of port expend IC 74HC595.
71	P97	not used	not used. (at normal: "L")
72	P96	not used	not used. (at normal: "L")
73-78	P95-P90	P1-P6	Segment output terminal. (at active: "H")
79	VLOAD	VLOAD	FIP controller/driver pull down resistor connect terminal.
80-87	P87-P80	P7-P14	Segment output terminal. (at active: "H")
88	FIP12	P15	
89	FIP11	P16	
90	FIP10	P17	
91	FIP9	1G	Grid output terminal. (at active: "H")
92	FIP8	2G	
93-99	FIP7-FIP1	4G-10G	
100	FIP0	3G	

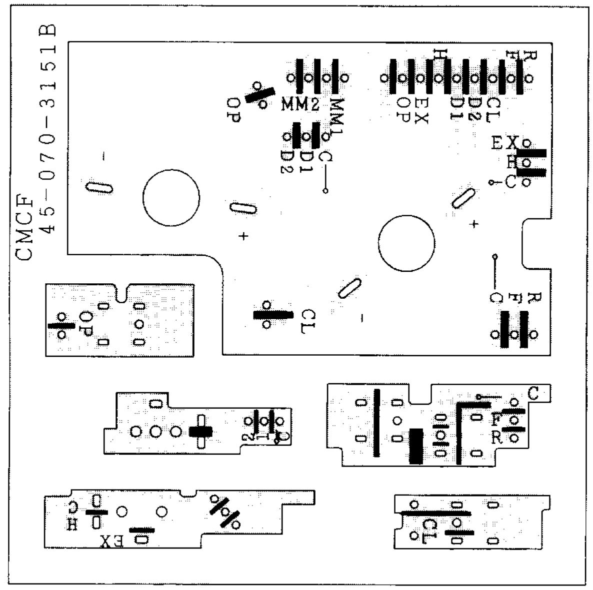
CD DRIVE EXPLODED VIEW AND PARTS LIST(KSM-213CCM)



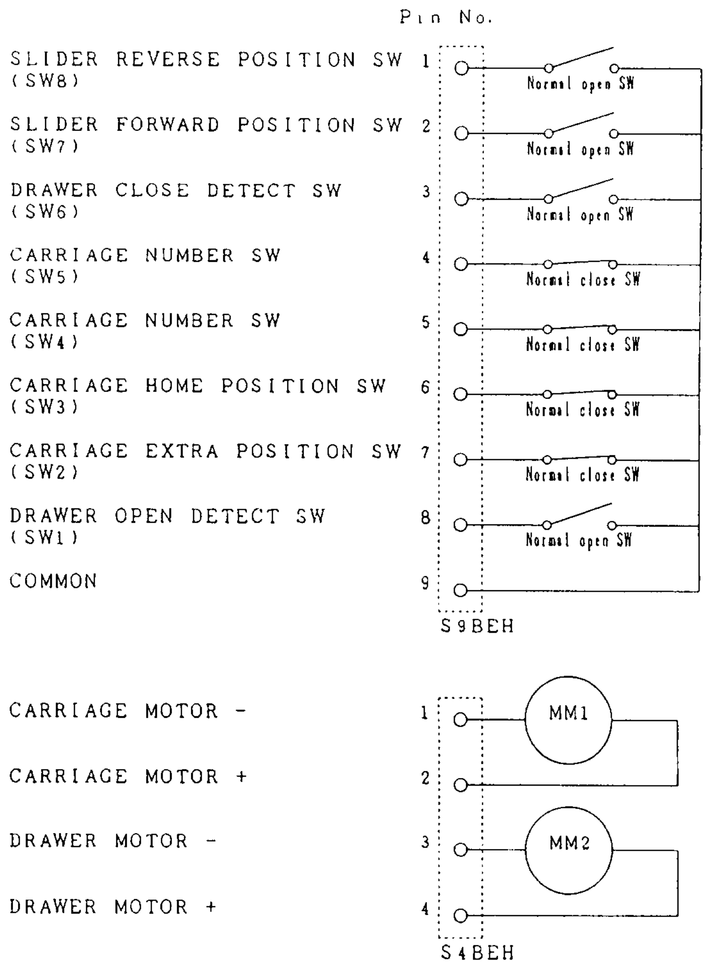
REF.NO.	'PART.NO.	'DESCRIPTION
1	X-2625-877-1	Motor chassis ass'y
2	X2625-769-1	Motor gear ass'y
3	2626-908-01	Sled shaft
4	24810023	Gear A
5	7621-255-15	P2x3,Pan head screw
6	24840008	Leaf switch
7	1639-678-12	Motor PC board
8	1564-722-11	6P, Connector pin
9	8848-483-05	KSS-213C, Optical pickup

CD MECHANISM PC BOARD





SCHEMATIC DIAGRAM



PRINTED CIRCUIT BOARD PARTS LIST

MAIN CIRCUIT PC BOARD (NAAR-5989-2B/2C)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Front end	
TU001	240102	FE417-G02 <P>
	240131	ENV172D4G1 <D>
	ICs	
Q104	22241089R2	BA1449F
Q131	22241088R2	LM7001JUM
Q181	22240679	MPC1346CS <P>
Q201	22240581R2	NJM4565M
Q301	22240924R2	AN8806SB-E1
Q302	22240925R3	MN662720RB
Q303	22240927R2	AN8389SR-E1
Q305,Q306	22240239	TA7291S
Q307	22241074R2	SM5877AM-ET
Q701	22241267R3	MPD780206GF-040
Q708	22240239	TA7291S
	Photo coupler	
Q315	24120038	GP1F32T
	Transistors	
Q101	2210746	2SC945A-P <P>
Q102	2211723	2SC1923-O
Q105	221282	DTC144ES
Q132	2213284 or	2SC1740S-R or
	2212115	2SC2458-GR
Q133	2212445	2SK365-GR
Q134,Q205	2213510 or	DTA114ES or
	2214350	RN2202
Q172	2214603R2	2SC2714-O <P>
Q203,Q204	2212794	2SD1468-R
Q304	2211504	2SA950-Y
Q312,Q313	2211504	2SA950-Y
Q313	2211504	2SA950-Y
Q314,Q702	2214490R2	RN1404
Q703	2214540R2	RN2403
	Diodes	
D101,D102	223234R2	1SS352
D103	223234R2	1SS352 <D>
D131	223234R2	1SS352
D181	223234R2	1SS352 <P>
D301,D302	223234R2	1SS352
D701,D708	223234R2	1SS352
D702	224490560R2	UDZ5.6B
D703-D706	223234R2	1SS352
D707,D709	22380035	GP104003E
	Coils	
L102	233383	NMC-6070 <P>
L201,l202	233484	NMC-4085
L301	231237K100R2	NCH-1475
	Ceramic filters	
X101	3010071	SFE-10.7MA5 RED
X102	3010071	SFE-10.7MA5 RED <P>
X103	3010130	SFE10.7MZ2K <P>
	3010071	SFE-10.7MA5 RED <D>
X104	3010258	CDA10.7MG60H15-A <P>
	3010251	CDA10.7MG60K-A <D>

CIRCUIT NO.	PART NO.	DESCRIPTION
	Oscillators	
X131	3010141 or	XTL-7.2M or
	3010260	HC-49/U03 7.2M, Crystal
X181	3010203	AF6146CG,Crystal <P>
X301	3010112	KD6586FFB,Crystal
X701	3010224	XTL-4.19M,Crystal
	Capacitors	
C001,C111	393341007	10 μ F,16V,Elect.
C106	393321017	100 μ F,6.3V,Elect.
C107,C108	354780229	2.2 μ F,50V,Elect.
C109,C301	374724734	0.047 μ F±5%,50V,Plastic
C110,C131	354782299	0.22 μ F,50V,Elect.
C112	393380107	1 μ F,50V,Elect.
C114	354741009	10 μ F,16V,Elect. <P>
C114	354744709	47 μ F,16V,Elect. <D>
C116	354780109	1 μ F,50V,Elect.
C117,C138	353721019	100 μ F,6.3V,Elect.
C120	374721044	0.1 μ F±5%,50V,Plastic <D>
C132,C134	354780229	2.2 μ F,50V,Elect.
C133	374723334	0.033 μ F±5%,50V,Plastic
C184,C190	374724724	4700pF±5%,50V,Plastic <P>
C185	374722234	0.022 μ F±5%,50V,Plastic <P>
C186	374724734	0.047 μ F±5%,50V,Plastic <P>
C187	354780229	2.2 μ F,50V,Elect. <P>
C188,C189	374723324	3300pF±5%,50V,Plastic <P>
C192	354721019	100 μ F,6.3V,Elect. <P>
C201,C202	374721034	0.01 μ F±5%,50V,Plastic <P>
C201,C202	374721534	0.015 μ F±5%,50V,Plastic <D>
C203,C204	393341007	10 μ F,16V,Elect.
C205,C206	393341007	10 μ F,16V,Elect.
C207,C208	374722724	2700pF±5%,50V,Plastic
C209,C304	393344707	47 μ F,16V,Elect.
C211	354780229	2.2 μ F,50V,Elect.
C305,C320	393380107	1 μ F,50V,Elect.
C310,C311	374721044	0.1 μ F±5%,50V,Plastic
C315,C317	393321017	100 μ F,6.3V,Elect.
C321	374722244	0.22 μ F±5%,50V,Plastic
C325	374723344	0.33 μ F±5%,50V,Plastic
C328,C330	355721019	100 μ F,6.3V,Elect.
C332,C339	355721019	100 μ F,6.3V,Elect.
C334	355744709	47 μ F,16V,Elect.
C341,C343	393321017	100 μ F,6.3V,Elect.
C345	393324717	470 μ F,6.3V,Elect.
C349	393342217	10 μ F,16V,Elect.
C351,C352	374721044	0.1 μ F±5%,50V,Plastic
C353,C354	393322217	220 μ F,6.3V,Elect.
C357	393380337	3.3 μ F,50V,Elect.
C372,C374	393321017	100 μ F,6.3V,Elect.
C702	3060029	NTC-30P25,Trimmer
C704	355780229	2.2 μ F,50V,Elect.
C706	3000076T	EECS5R5T104,Super
C707,C708	393321017	100 μ F,6.3V,Elect.
C709,C713	393321017	100 μ F,6.3V,Elect.
C710	355721019	100 μ F,6.3V,Elect.
C712,C716	393361017	100 μ F,35V,Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R101	5215046	N08HR50KBC,Trimming
R181	5215003	N08HR20KBC,Trimming <P>
	Plugs	
P181	25055038	NPLG-2P29 <P>
P302	25055370	NPLG-6P353
P303	25055240	NPLG-9P224
P304	25055235	NPLG-4P219
P305	25055045	NPLG-4P33
P701	25055038	NPLG-2P29
P705B	25055367	NPLG-3P350
	Sockets	
P201	2002390815	NSAS-8P0309
P301	25052136	NSCT-16P2034
P306A	2002391615	NSAS-16P0194
P411A	25051235	NSCT-10P1025
P412A	25051231	NSCT-6P1021
P704A	25050975 or	NSCT-35P762 or
	25050865	NSCT-35P660
	Terminal	
P101	25060231	NTM-1PD153,Antenna
	Shield plate	
TU001a	27150387	Front end

PREAMPLIFIER PC BOARD (NAAF-5990-2B/2C)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q401	22241072	TC9273N-007
Q431,Q522	22240273	NJM4565S-D
	Transistors	
Q403-Q406	2213631 or	RN1241-A or
Q519,Q520	2213632	RN1241-B
Q481	2213510	DTA114ES
Q591	2213354	2SA933S-R
Q592	2213284	2SC1740S-R
Q593	2213510	DTA114ES
	Diode	
D503	223163,	1SS133,
	223205 or	1SS270A or
	223222	WG713A
D901	22380048	RBA-402
	Capacitors	
C431,C432	393341007	10 μ F,16V,Elect.
C433,C434	374721824	1800pF±5%,50V,Plastic
C435,C436	374723924	3900pF±5%,50V,Plastic
C437,C438	374721824	1800pF±5%,50V,Plastic
C439,C440	374723624	3600pF±5%,50V,Plastic
C441,C442	374721824	1800pF±5%,50V,Plastic
C443,C444	374724714	470pF±5%,50V,Plastic
C445,C446	393341007	10 μ F,16V,Elect.
C451-C454	393341007	10 μ F,16V,Elect.
C481	393380107	1 μ F,50V,Elect.
C525-C528	354781599	0.15 μ F,50V,Elect.
C581	355721019	100 μ F,6.3V,Elect.
C582,C583	393380107	1 μ F,50V,Elect.
	Resistor	
R425	5104338	N16RQL100KBT25F,Variable

CIRCUIT NO.	PART NO.	DESCRIPTION
	Terminals	
P401	25045300 or	NPJ-6PDBL159 or
	25045458	NPJ-6PDBL279
P402	25045305	NPJ-4PDBL164 <D>
	25045303 or	NPJ-4PDBL162 or
	25045460	NPJ-4PDBL281 <P>
P403	25045504	NPJ-1PDBL319
	Plugs	
P411	25055706	NPLG-10P662
P412	25055702	NPLG-6P658
P413	25055708	NPLG-12P664

POWER SUPPLY PC BOARD (NAAF-5991-2B/2C)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q521	22240605	TC9184P
Q901	222780125NEC	MPC78M12HF(78M12HF)
Q903	222780095JRC	NJM78M09FA(78M09HF)
Q904	222780565JRC	NJM78M56FA(78M56)
Q905	222951	M51943B
	Transistors	
Q501-Q504	2211733	2SC1845-E
Q505-Q508	2213284	2SC1740S-R
Q509-Q514	2211455	2SA1015-GR
Q515-Q518	2211255	2SC1815-GR
Q601	2212445	2SK365-GR
Q602	2213284	2SC1740S-R
Q603	2211504	2SA950-Y
Q902	2211455	2SA1015-GR
	Diodes	
D491,D492	224470823	MTZJ8.2C
D501,D502	223163 or	1SS133 or
D601	223205 or	1SS270A or
	223222	WG713A
D911-D917	22380035 or	GP104003E or
	22380260	RL1N4003
D918	224452704	MTZ27D
D919,D920	224470512	MTZJ5.1B
	Coils	
L401-L404	231126	NCH-1182
	Fuse	
F901	252083	⚠ 0.4A-SE-EAWK,Fuse <P>
	252158	⚠ 1.6A-UL/T-237, Fuse <D>
	Fuse holder	
F901a	25050065	⚠ YSH403T
	Capacitors	
C491,C492	393343317	330 μ F,16V,Elect.
C501,C502	393341007	10 μ F,16V,Elect.
C507,C508	393361017	100 μ F,35V,Elect.
C511,C512	393322217	220 μ F,6.3V,Elect.
C513,C514	374725624	5600pF±5%,50V,Plastic
C515,C516	374723334	0.033 μ F±5%,50V,Plastic
C517,C518	374721844	0.18 μ F±5%,50V,Plastic
C519,C520	374723334	0.033 μ F±5%,50V,Plastic
C521,C522	393380227	2.2 μ F,50V,Elect.
C523,C524	393341007	10 μ F,16V,Elect.
C539,C540	393322217	220 μ F,6.3V,Elect.
C541,C542	393341007	10 μ F,16V,Elect.

CIRCUIT NO.	PART NO.		DESCRIPTION
C601	354781009		10μF,50V,Elect.
C602	354764709		47μF,35V,Elect.
C902,C903	374721044		0.1μF±5%,50V,Plastic
C904,C905	3504301		3300μF,35V,Elect.
C911	374721034		0.01μF±5%,50V,Plastic
C912	354764709		47μF,35V,Elect.
C913	3504307		3900μF,25V,Elect.
C915,C917	393341007		10μF,16V,Elect.
C921	354764709		47μF,35V,Elect.
C922	354782219		220μF,50V,Elect.
C923	393361007		10μF,35V,Elect.
C924,C925	393361017		100μF,35V,Elect.
C928	393380107		1μF,50V,Elect.
	Resistors		
R515-R522	443523904		39Ω±5%,1/2W,Metal oxide
R591,R592	443522204		22Ω±5%,1/2W,Metal oxide
R611	443522714		270Ω±5%,1/2W,Metal oxide
R901	453530824		8.2Ω±5%,1/2W,Metal
R911	453534794		0.47Ω±5%,1/2W,Metal
R917	453530104		1Ω±5%,1/2W,Metal <D>
R921,R926	453530224		2.2Ω±5%,1/2W,Metal
R922	443522704		27Ω±5%,1/2W,Metal oxide
R991	431533355	⚠	3.3MΩ,1/2W,Solid <D>
	Wire trap		
JL401b	25055628		NPLG-7P590
	Socket		
JL503b	25050267		NSCT-3P95
P413a	25051237		NSCT-12P1027
	Plugs		
P201a	25055148		NPLG-4P132
P306a	25055152		NPLG-8P136
P601a	25055099		NPLG-2P83
P771a,P908a	25055146		NPLG-2P130
P901a	25055676	⚠	NPLG-2P632
P902a	25055675	⚠	NPLG-2P631
P903a	25055135		NPLG-5P119
	Screw		
E806	82143010		3P+10FN(BC),Pan head
	Radiators		
Q903a	27160145		RAD-51
Q904a	27160176		

POWER AMPLIFIER PC BOARD (NAAF-5992-2B/2C)

CIRCUIT NO.	PART NO.		DESCRIPTION
	Transistors		
Q551,Q552	2213284		2SC1740S-R
Q553,Q554	2211654 or		2SC2235-Y or
	2211653		2SC2235-O
Q555,Q556	2211644 or		2SA965-Y or
	2211643		2SA965-O
Q557,Q558	2202063,	*	2SC4511-O,
	2202064 or	*	2SC4511-Y or
	2202066	*	2SC4511-P
Q559,Q560	2202053,	*	2SA1725-O,
	2202054 or	*	2SA1725-Y or
	2202056	*	2SA1725-P

CIRCUIT NO.	PART NO.	DESCRIPTION
	Coils	
L501,L502	231176SY	S-1.3C <P>
	Capacitors	
C553,C554	393341007	10μF,16V,Elect.
C555,C556	374724734	0.047μF±5%,50V,Plastic
	Resistors	
R565,R566	443521014	100Ω±5%,1/2W,Metal oxide
R567,R568	4500027	0.22Ω±5%,2W,Metal plate
R571,R572	453530824	8.2Ω±5%,1/2W,Metal
R573,R574	453530564	5.6Ω±5%,1/2W,Metal <P>
	Wire holders	
JL401a	25051091	NSCT-7P878
JL501a	25051088	NSCT-4P875
JL502a	25051089	NSCT-5P876
JL503a	25051107	NSCT-3P894

SPEAKER TERMINAL PC BOARD (NAETC-5993-2B/2C)

CIRCUIT NO.	PART NO.	DESCRIPTION
P501	25060245	NTM-4PDML165,Speaker terminal
JL502b	25055626	NPLG-5P588,Wire trap

DISPLAY CIRCUIT PC BOARD (NADIS-5994-2B/2C)

CIRCUIT NO.	PART NO.	DESCRIPTION
	FL tube	
Q751	212141	10BT-167GK
	IC	
Q771	222745955	74HC595P
	Remote sensor	
Q752	24130011	PIC-12043TE2
	L.E.Ds	
D771-D775	225320	SLR-342YY
	Capacitors	
C772,C773	353721019	100μF,6.3V,Elect.
	Sockets	
P704a	25050941 or	NSCT-35P728 or
	25050897	NSCT-35P692
P771	2002390415	NSAS-4P0191
	Holders	
E701	27190943	(FL)
E771	27190998	(LED)

SWITCH CIRCUIT PC BOARD (NASW-5995-2B/2C)

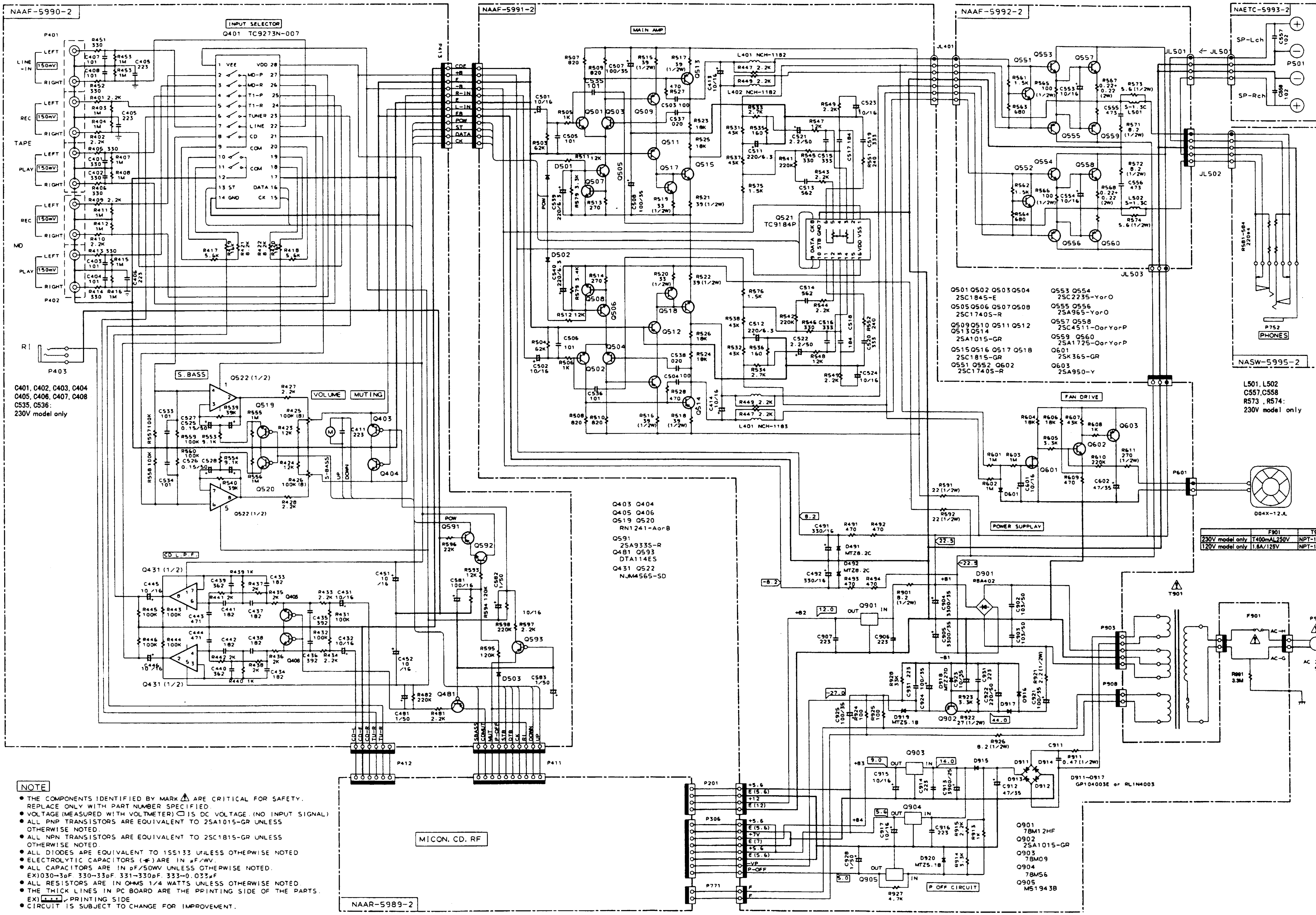
CIRCUIT NO.	PART NO.	DESCRIPTION
S781-S792	25035652	NPS-111-S604,Switch
P752	25045396	LGT1516-0101,Terminal
P705	2002320615	NSAS-6P0023,Socket
JL501b	25051088	NSCT-4P875,Wire holder

CAUTION : **Replacement of the transistor of mark *, if necessary mast be made from the same beta group (HFE) as the original type.**

NOTE: <P>: 230V model only
<D>: 120V model only

NOTE : THE COMPONENTS INENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

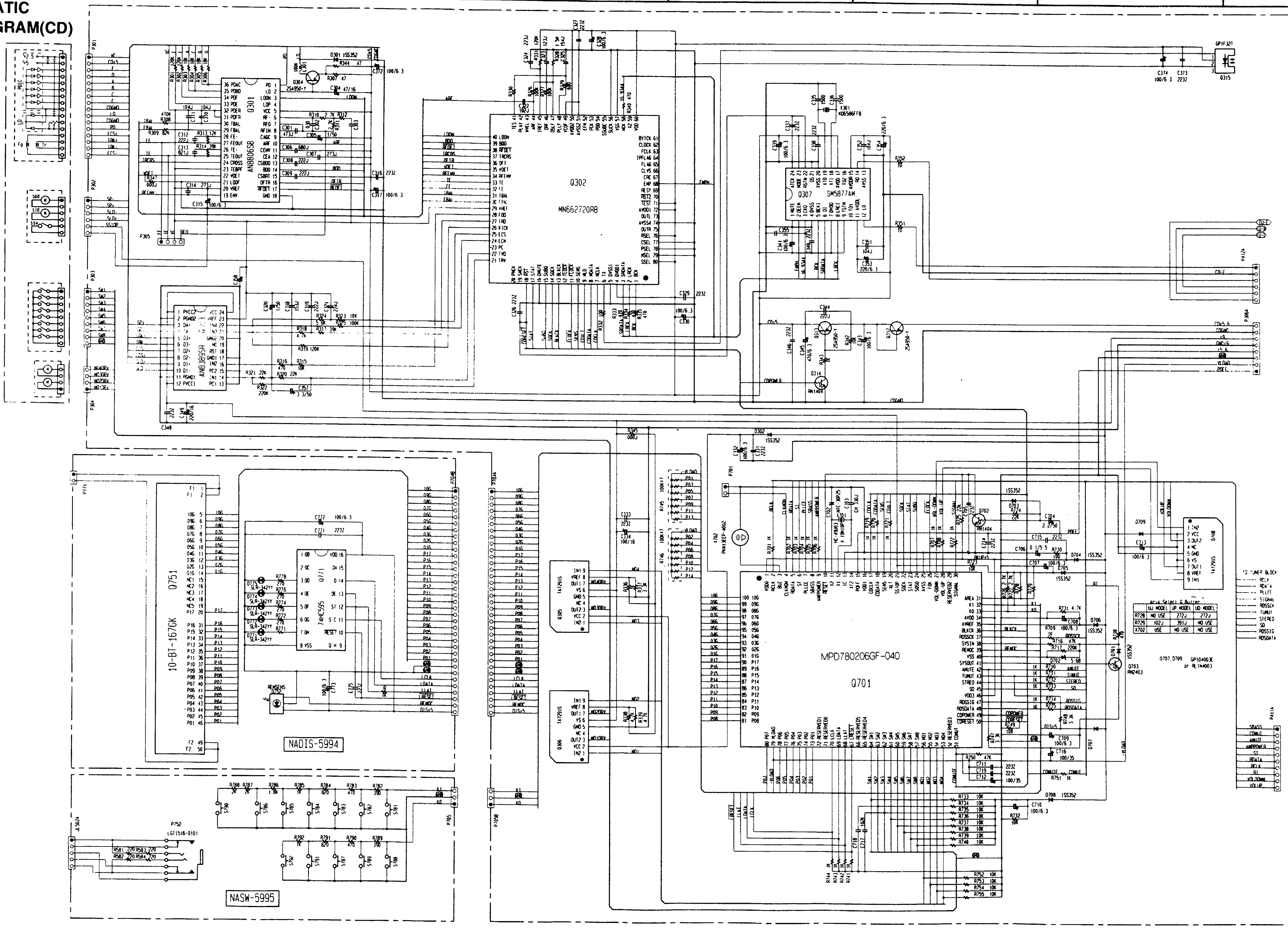
SCHEMATIC DIAGRAM(Amp)



NOTE

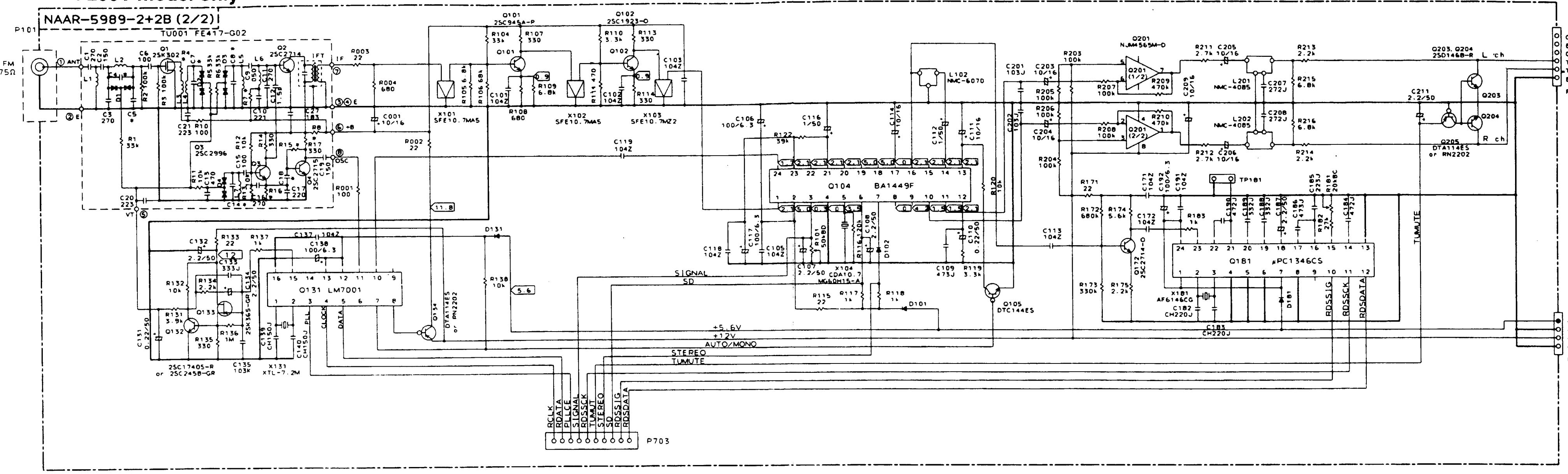
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE (MEASURED WITH VOLTMETER) ▭ IS DC VOLTAGE. (NO INPUT SIGNAL)
- ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-GR UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-GR UNLESS OTHERWISE NOTED.
- ALL DIODES ARE EQUIVALENT TO 1SS133 UNLESS OTHERWISE NOTED
- ELECTROLYTIC CAPACITORS (⊣⊢) ARE IN μF/WV.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED. EX)030→3pF. 330→33pF. 331→330pF. 333→0.033μF
- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
- THE THICK LINES IN PC BOARD ARE THE PRINTING SIDE OF THE PARTS. EX) ▭ ✓PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

SCHEMATIC DIAGRAM(CD)

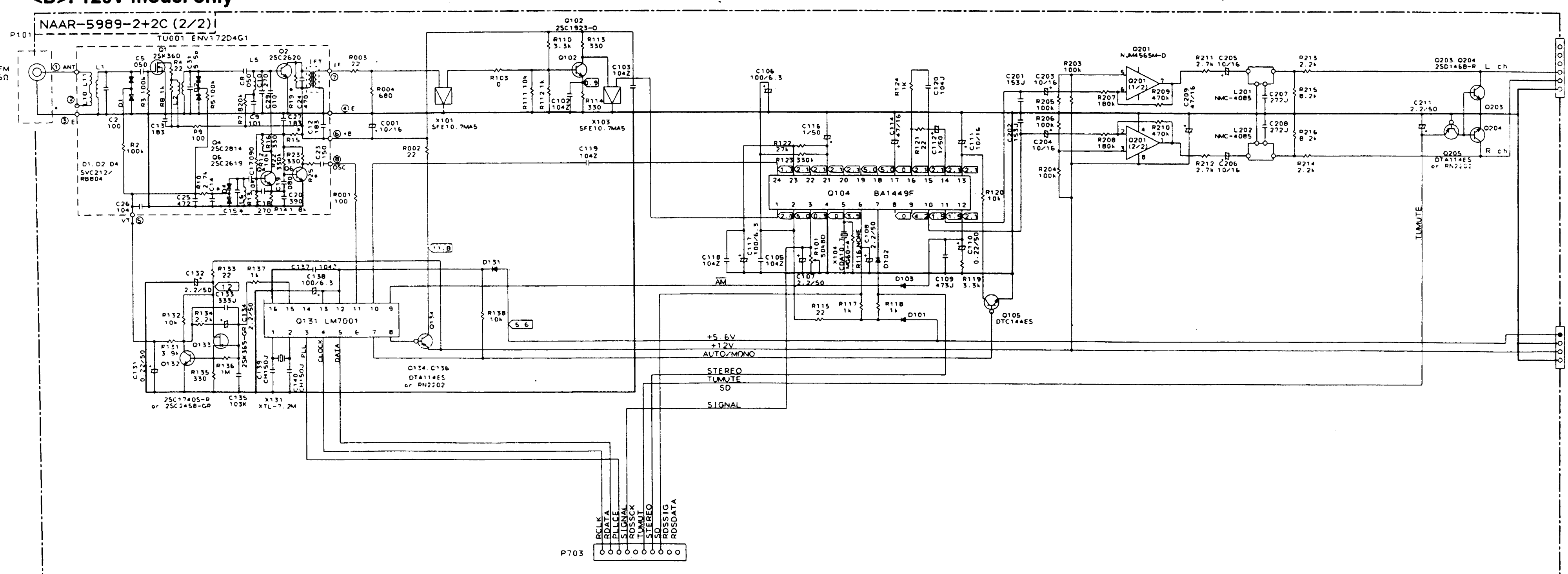


SCHEMATIC DIAGRAM(Tu)

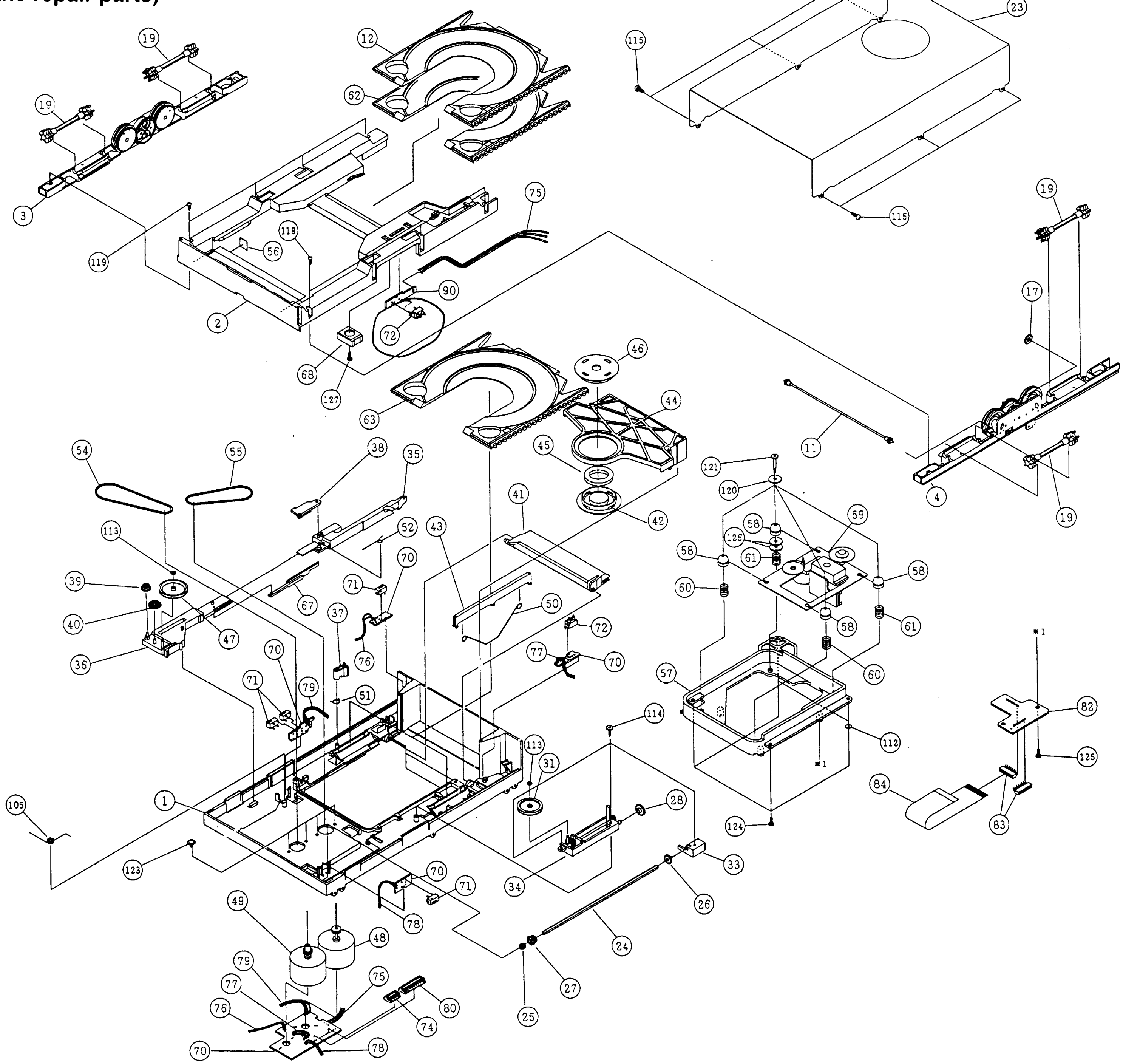
<P>: 230V model only



<D>: 120V model only

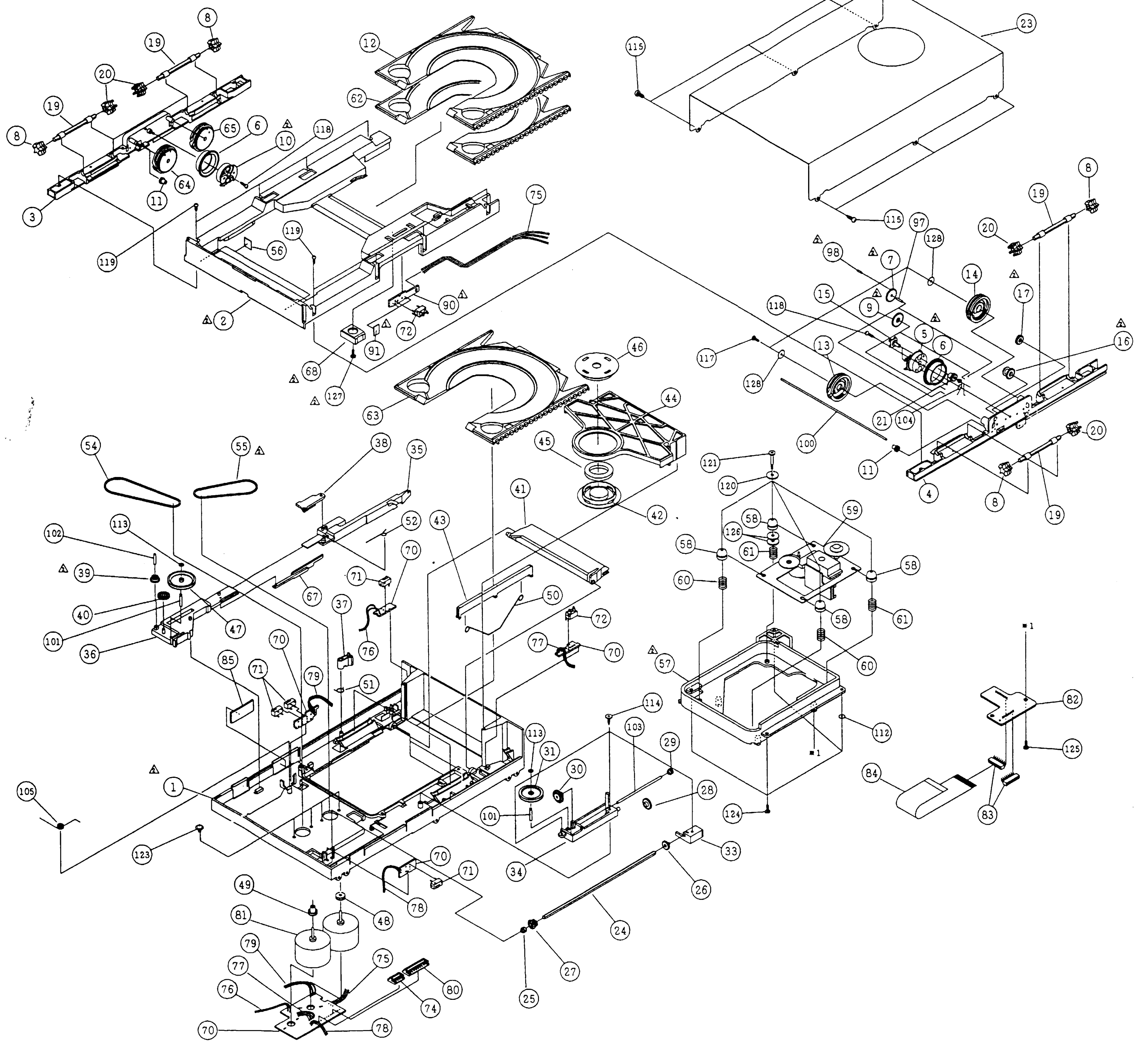


MECHANISM EXPLODED VIEW AND PARTS LIST
es for the repair parts)



REF.NO	PART.NO.	DESCRIPTION	NOTE
1	45-093-4160	Chassis 2 assembly	
2	45-264-4159	Tray	
3	45-093-4088	Holder L assembly	
4	45-093-3249	Holder R3 assembly	
11	45-093-4075	Drive gear assembly	
12	45-264-1109F	Carriage 10	
17	45-222-4214	Vevel gear 4	
19	45-093-4084	Star gear assembly	
23	45-112-2001	Cover	
24	45-300-4018	Shaft	
25	45-262-4019	Cap	
26	45-222-4021	Gear spline	
27	45-222-4059	Vevel gear 1	
28	45-222-4026	Idler gear 1	
31	45-222-4058	Pulley C	
33	45-219-4062	Holder 2	
34	45-093-4076	Holder 1 assembly	
35	45-259-2031	Slider 1	
36	45-093-4091	Slider 2 assembly	
37	45-239-4064	Arm stopper A	
38	45-239-4065	Arm stopper B	
39	45-222-4128	Idler gear A	
40	45-222-4051	Idler gear C	
41	45-259-3008	Lever	
42	45-229-3024	Clamper A	
43	45-259-3025	Lifter	
44	45-239-1037	Arm	
45	36-067-4928	Magnet	
46	45-229-3069	Clamper B	
47	45-222-4052	Pulley A	
48	45-093-4162	Carriage motor 2 assembly	
49	45-093-4163	Tray motor 2 assembly	
50	01-000-4541	Spring	
51	01-082-4558	Spring	
52	01-082-4559	Spring	
54	02-083-4167	Belt	
55	02-083-4174	Belt	
56	45-063-4136	Cushion	
57	45-211-3072	Frame S	
58	45-063-4072	Rubber cushion	
59	24800017Y	Drive unit	
60	01-081-4561	Spring	
61	01-081-4562	Spring	
62	45-264-1110F	Carriage 20	
63	45-264-1111F	Carriage 30	
67	45-219-4107	Plate E	
68	45-219-4127	Spacer switch	
70	45-070-3151	PC board	
71	MPU10101MMB0	Switch	
72	MPU20273BLB0	Switch	
74	S4BEH	Connector	
75		Lead wire	
76		Lead wire	
77		Lead wire	
78		Lead wire	
79		Lead wire	
80	S9BEH	Connector	
82	45-070-4155	PC board	
83	16FMNSTRK	Connector	
84	45-072-4083	Flat cable	
90	45-093-4269	ASS'Y PC board	
105	01-082-4577	Spring	
112	GWP23X055025	Flat washer	
113	GWP15X045025S	Washer	
114	GSL20A2010	Screw	
115	GSL20A2606	Screw	
119	GSL10B2006	Screw	
120	GSN31X120050	Flat washer	
121	03-300-4366	Screw	
123	GSP14A2604	Screw	
124	GSL20A2610	Screw	
125	GSL15A2006	Screw	
126	03-000-4427	Flat washer	
127	GST15A2005	Screw	

MECHANISM EXPLODED VIEW



REF. NO.	DESCRIPTION
1	CHASSIS 2
2	DRAWER
3	HOLDER L
4	HOLDER R3
5	SUPPORT GEAR R
6	GEAR RING
7	GEAR INDEX 6
8	GEAR STAR A
9	GEAR IDLER 7
10	SUPPORT GEAR L
11	GEAR DRIVE
12	CARRIAGE 10
13	CAM RF
14	CAM RR2
15	PINION
16	GEAR IDLER B3
17	BEVEL GEAR 4
19	GEAR STAR B
20	GEAR STAR C
21	GEAR PINION 3
23	COVER
24	SHAFT
25	CAP
26	GEAR SPLINE
27	BEVEL GEAR 1
28	GEAR IDLER 1
29	GEAR IDLER 3
30	BEVEL GEAR 3
31	PULLEY C
33	HOLDER 2
34	HOLDER 1
35	SLIDER 1
36	SLIDER 2
37	ARM STOPPER A
38	ARM STOPPER B
39	GEAR IDLER A
40	GEAR IDLER C
41	LEVER
42	CLAMPER A
43	LIFTER
44	ARM
45	MAGNET
46	CLAMPER B
47	PULLEY A
48	PULLEY MOTOR
49	PULLEY MOTOR
50	SPRING
51	SPRING
52	SPRING
54	BELT
55	BELT
56	CUSHION
57	FRAME S
58	RUBBER CUSHION SO
59	PICK-UP UNIT
60	SPRING
61	SPRING
62	CARRIAGE 20
63	CARRIAGE 30
64	CAM LF
65	CAM LR
67	PLATE E
68	SPACER SW
70	PC BOARD
71	SWITCH
72	SWITCH —
74	CONNECTOR
75	WIRE
76	WIRE
77	WIRE
78	WIRE
79	WIRE
80	CONNECTOR
81	MOTOR
82	PCB
83	CONNECTOR
84	CARD WIRE
85	RABBER CUSHION
•	•
90	PCB
91	SPACER
•	•
97	SHAFT
98	SHAFT
•	•
100	SHAFT DRIVE
101	SHAFT
102	SHAFT
103	SHAFT
104	SPRING
105	SPRING
•	•
112	WASHER
113	WASHER
114	SCREW
115	SCREW
117	SCREW
118	SCREW
119	SCREW
120	WASHER
121	SCREW
123	SCREW
124	SCREW
125	SCREW
126	WASHER
127	SCREW
128	WASHER

HOW TO DISMANTLE CD CHANGER MECHANISM

There are five parts, from A. to E.

A. How to remove CD Mechanism Assembly from unit:

1. Pull out Knob(VOL)(A57).
2. Remove five Screws(A45) from Top Cover(A44).
3. From the front remove one Screw(A3) which holding the Volume. When you remove Top Cover, pull Top Cover to behind as pushing down the front hooks which hold Front Panel.

Note :

1) In the Service Manual Screw(A3) is not included. (Screw drawing is only included.)

4. Turn the unit upside-down and short one point with solder from the Chassis hole. This point is marked with "S" on CD Mechanism PC Board. This is necessary to prevent Opt-pickup electrostatic damage. (See Fig. 1.)

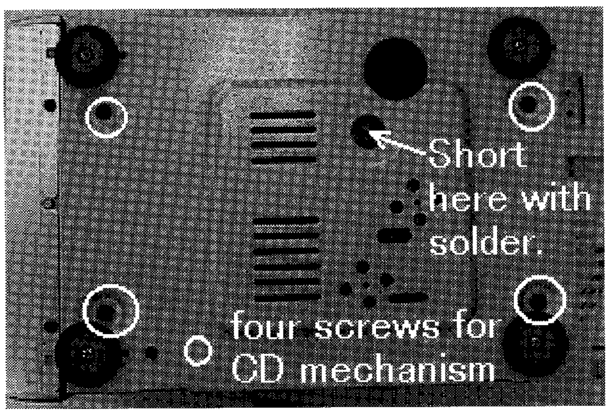


Fig. 1

5. Remove four Screws from Tuner Circuit PC Board, U1.
6. Remove Screws from Rear Panel(A151) as follows.

Two Screws for Antenna Terminal, One Screw for Optical Jack, Two Screws for Pin-jack and Four Screws for Rear Panel

Then remove two black Screws(A14) which are fixing Heat Sink. (See Fig. 2, 5.)

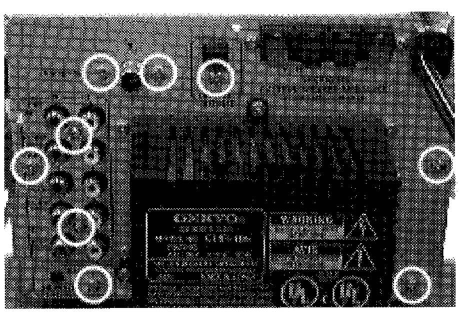


Fig. 2

7. Pull out three connectors(P302, P303, P304) which are located right in Tuner Circuit as seeing from behind and are connected from CD Mechanism(Z1). Remove Flexible Flat Cable(P301) from Tuner Circuit. (See Fig. 3)

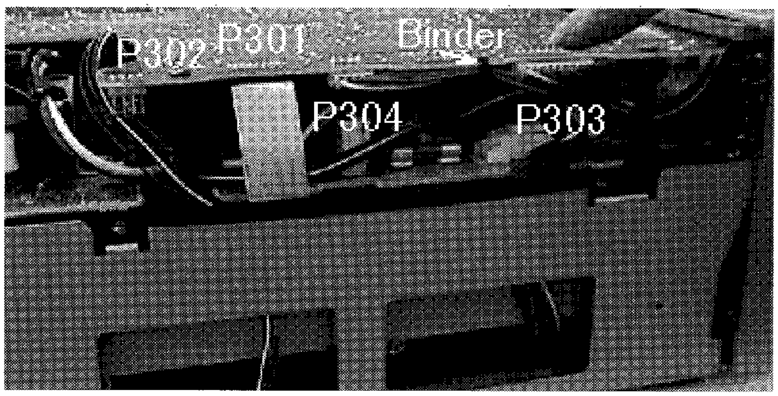


Fig. 3

8. 1) Pull out two Connectors(P411, P412) which are connecting U1, Tuner Circuit and U2, Pre-amp. Circuit, as pushing U1 to right. Then, as lifting the front part of U1 and pushing it to front, pull out Antenna Terminal part from Rear Panel.

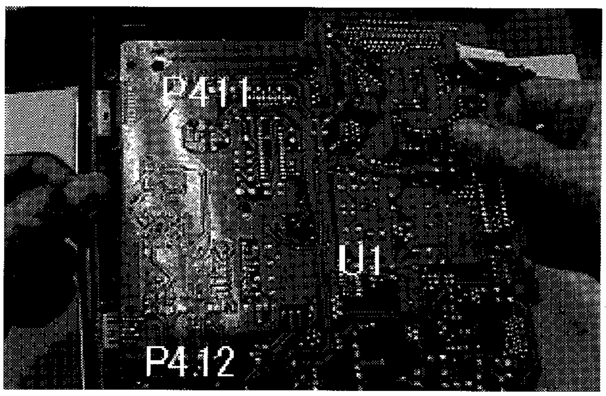


Fig. 4

2) As lifting Tuner Circuit pull out Flexible Cable Wire(P704) which is connected from Display Circuit, U6. Pull out four Connectors(P201, P306, P771, P705B) which are connected from U3, Power Supply Circuit and remove U3. (See Fig. 5.)

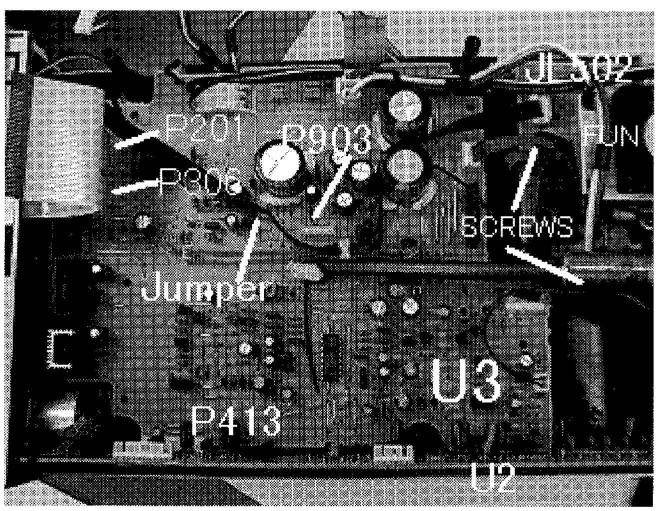


Fig. 5

9. Pull out Jumper Wire(JL502) from U4, Main-amp. Circuit.

10. 1) Remove three Screws from U3, Power Supply Circuit. (See Fig. 5.)
2) As lifting the right side of U3 from seeing from behind, remove one Connector(P413) from U2.

3) Remove two Screws(A19) from U4. As seeing from behind, one Screw at left side of Bracket(FU)(A18), one Screw at the front of U4.

11. As lifting Power Supply, U3 and Rear Panel block (with Bracket(PT)(A22)), bring these back until the bottom of Heat Sink comes over the Chassis end bent part. Then remove these with connecting wires out of the unit. (See Fig. 6.)

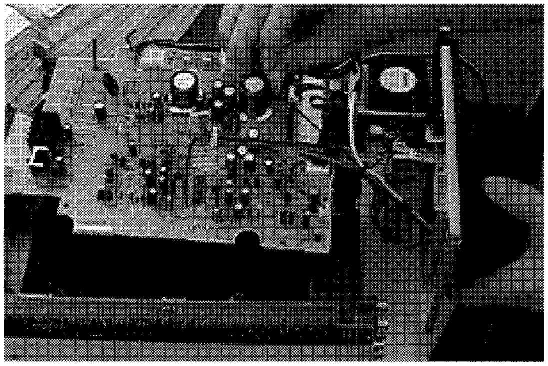


Fig. 6

12. Remove three Screws which is fixing Holder(MEC)(A7).(See Fig. 7.) When you remove Holder, it is easy to pull back it together with U2. (See Fig. 8.)

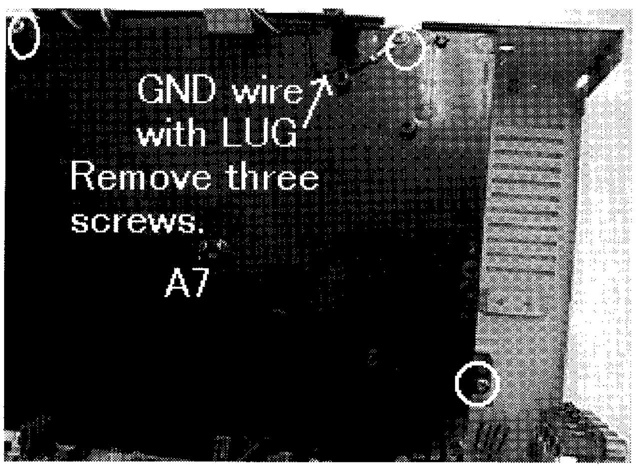


Fig. 7

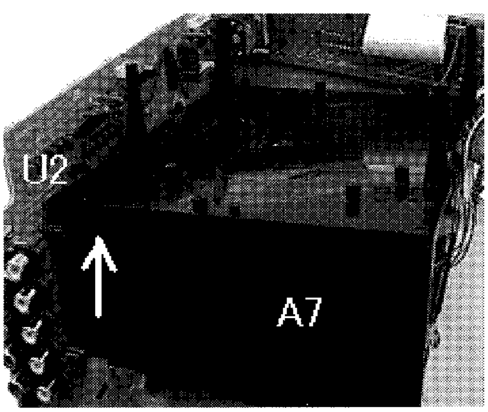


Fig. 8

13. As preparing one suitable table for putting CD Mechanism when the unit is turned over, turn the unit and remove four Screws(A5) and remove the CD Mechanism.

14. Pull up Door(A54) from CD Mechanism.

15. Remove one Screw which is fixing a Clamp beside CD Mechanism.

Turn CD Mechanism upside-down and remove three Connectors(P302, P303, P304) and one Flexible Flat Cable(P301) from CD Mechanism PC Board.

B. How to dismantle CD Changer Mechanism:

When replacing the optical pickup, first short the pattern on the CD Pick Up PC Board. (See Fig.1) Short the pattern for electrostatic protection on the CD Pick Up PC board before removing the flexible flat cable from it. After soldering, remove the flexible flat cable from the CD Pick Up PC Board.

When replacing mechanism parts, do as follows:

First short the pattern with "S" for electrostatic protection on U-shaped CD mechanism PC Board.(Short from the bottom chassis hole.)(See Fig.9, Fig.10.)

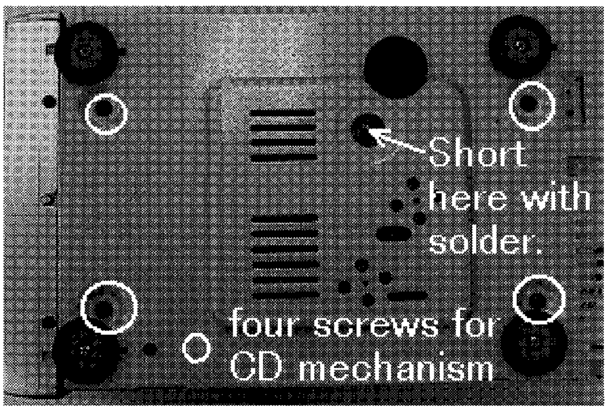


Fig.9

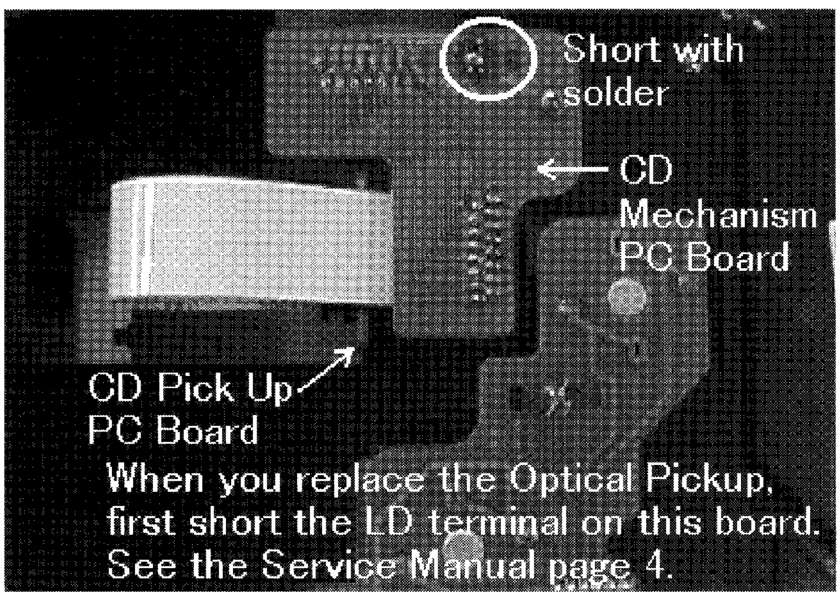


Fig.10

C. How to remove the Drawer block:

1. This is the normal way. (See pages 39 and 40 in the Service Manual.)

1) Remove 6 SCREWS(115) from COVER(23).
2) Turn PULLEY B(49)anti-clockwise and pull DRAWER(2) block. The DRAWER block is easily pulled out.(See Fig.11)

□ You can remove the lock of DRAWER by doing so.

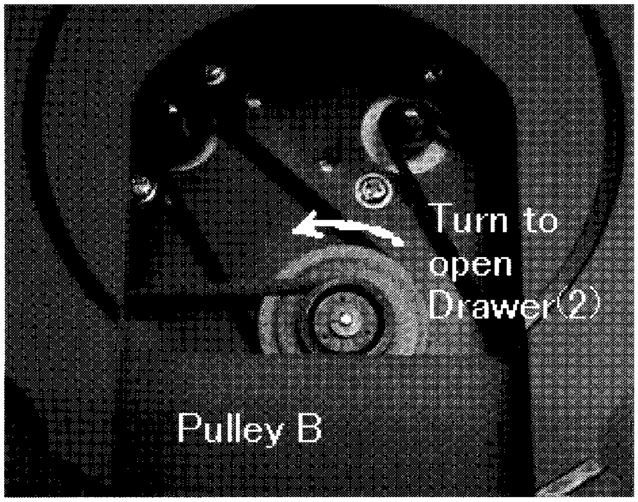
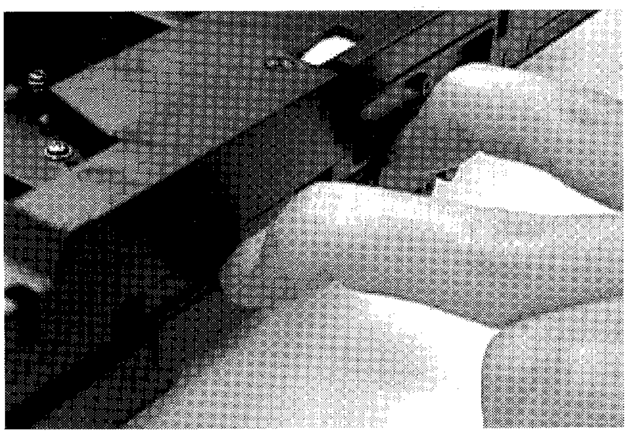


Fig.11

3) After pulling out DRAWER block until around its half, divide CHASSIS(1) block hooks which fixing DRAWER block from the two points of left side then the right two with a minus(-) shaped driver or fingers.(See Fig. 12)(Because gears gang together inside at the right side.) With holding DRAWER block .

Notes: In this case, please note that GEAR IDLER 2(with BEVEL GEAR) and GEAR IDLER A are lost easily.


Fig.12

2. This is the way when Carriages are jammed inside.

1) Remove 6 SCREWS(115) from COVER(23).
2) Divide CHSSIS(1) block hooks which fixing DRAWER(2) block from the two points of Left side then the right two with a minus(-) shaped driver or with fingers as like as below..(Because gears gang together inside at the right side.) With holding DRAWER block .

D. How to remove CARRIAGEs?

How to remove **CARRIAGEs 10, 20 or 30**(Carriage number changes with chances of Disk stopping) from CHASSIS(1).

1) Slide SLIDER 2(36) block inside and make the pin locked at inner-most of SLIDER 2 with ARM STOPPER B(38).

2) Then, slide SLIDER 2(36) outside.
3) By sliding SLIDER 2, ARM(44) moves up and it is locked.
4) Then **CARRIAGE** are unlocked and are easily removed outside.

Note : How to distinguish **CARRIAGEs 10, 20 or 30**.(See Fig.13)

Turn CARRIAGE upside-down and you can see two posts for CARRIAGE number detection.

CARRIAGE 10 has one post at inside.

CARRIAGE 20 has one post at outside.

CARRIAGE 30 has two posts at the both sides.

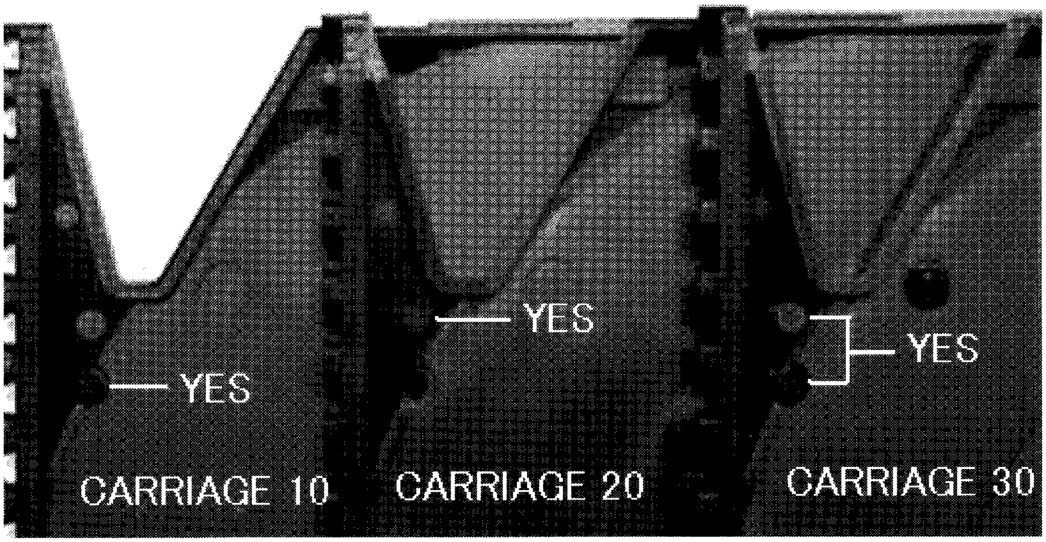


Fig.13

How to remove CARRIAGES from DRAWER block

1) Turn BEVEL GEAR 4(17) anti-clockwise. (See Fig. 14.)
2) By turning BEVEL GEAR 4, the uppermost CARRIAGE slides out.
3) Hold the CARRIAGE at its center and bring it up. Then you can take it out.
4) Then, turn BEVEL GEAR 4 (17) anti-clockwise and take out the second CARRIAGE.
5) Take out the bottom CARRIAGE with the same way.

Note : BEVEL GEAR 4 falls down easily. Take care for its missing.

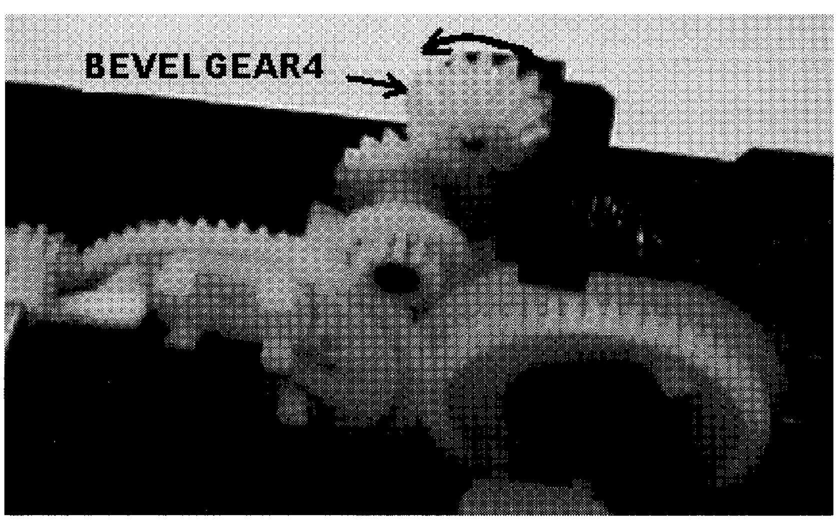


Fig.14

E. How to re-assemble DRAWER block

A) First insert **CARRIAGE 30**(63) between ARM(44) and TURN TABLE and set it until inside end. Push SLIDER 2(36) block down and slide it until inside end. CARRIAGE is locked with ARM.

B) How to set CARRIAGEs to DRAWER(2)

1) Turn BEVEL GEAR 4 (17) clockwise. The lower PINION in GEAR SUPPORT turns anti-clockwise. After it stops, the upper PINION turns clockwise. Just before the lower PINION starts to turn, stop to turn GEAR IDLER 2. Set **CARRIAGE 20**(62) as fitting it with the lower PINION as Fig. 15.

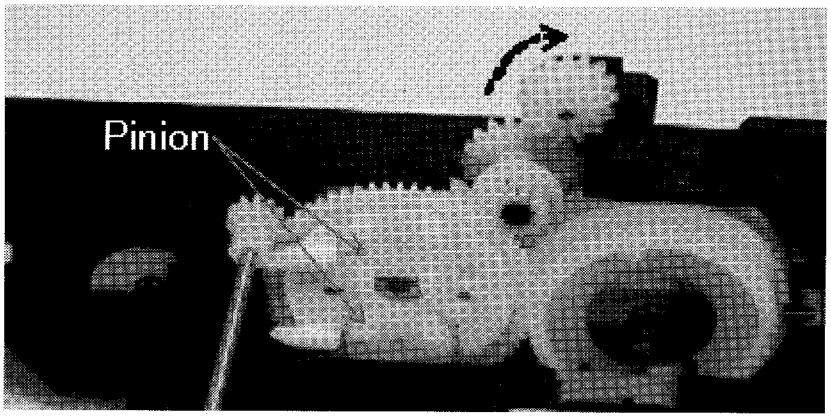


Fig.15

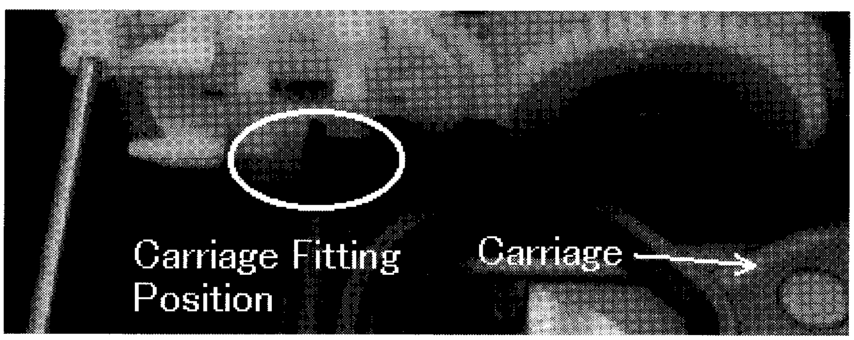


Fig.16

2) Then push in the left side of **CARRIAGE 20** on STAR GEAR C(20) and the rail part by warping the CARRIAGE. (See Fig. 16.)

3) Turn BEVEL GEAR 4 (8) clockwise to move **CARRIAGE 20** inside. After it reaches innermost, you cannot turn BEVEL GEAR.

4) Then set **CARRIAGE 10**(12) as same as **20**.

5) Pulling up **CARRIAGE 20** horizontally, turn BEVEL GEAR 4 more clockwise. Then, **CARRIAGE 20** is installed and **CARRIAGE 10** moves inside by turning BEVEL GEAR 4(17) clockwise.

6) **CARRIAGEs** is set.

7) In assembly of the left side of CHASSIS, GEAR IDLER A(39) has a direction. (See Fig.18) Set it as its marking faced to the front. (If it doesn't have any marking, no need to take care of direction.)
Note : GEAR IDLER A(39) may fall down. Take care for its missing.
8) Move BEVEL GEAR 1(27) to the center of the SHAFT(24).
9) First attach the right side hook part of DRAWER block to CHSSIS block and BEVEL GEAR(27) (See Fig. 17). Then move DRAWER block inside as holding its left side up. Fit its left side project into the hole of CHASSIS end.

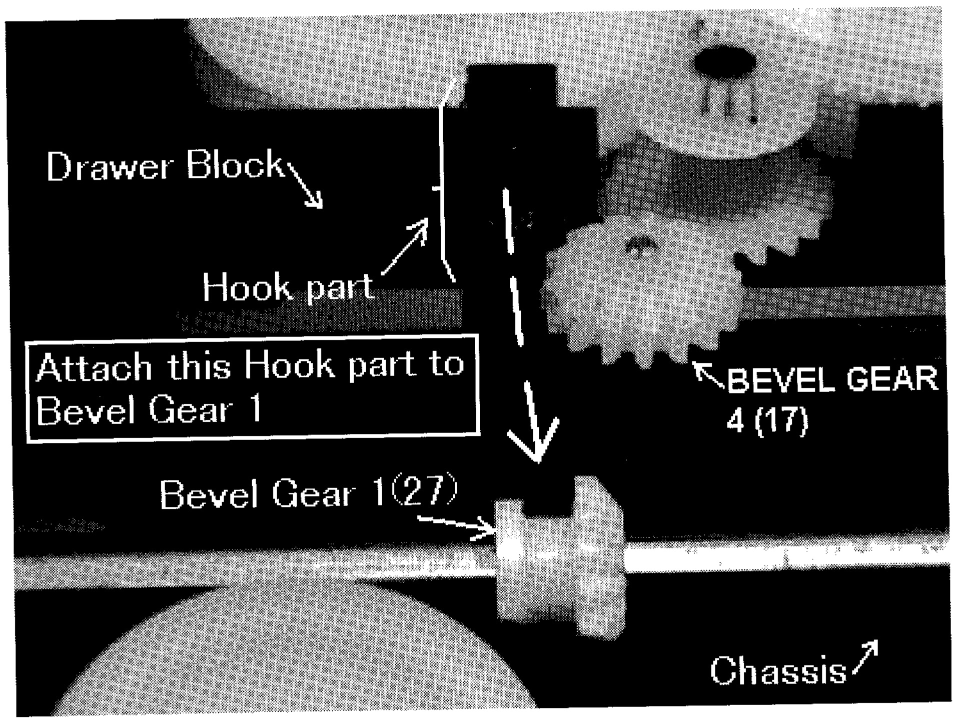


Fig.17

10) When you assemble DRAWER block with CHASSIS, it is important that linear gears in CHASSIS gang well with GEAR IDLER A(39). While GEAR IDLER A isn't ganged well, turn PULLEY B(49) (Fig. 11) a bit and make them ganged. (Take care not to turn it much. GEAR IDLER A should be in +/- 45 degrees from the center.) (See Fig. 18)
11) Push in two hooks at the both sides as they sound click. (You may fix the right side hooks first before you move Drawer block inside in item 9).
12) Put COVER(23) and mount six SCREWS(115).
13) This is a completed or removed condition. (See Fig. 19.)

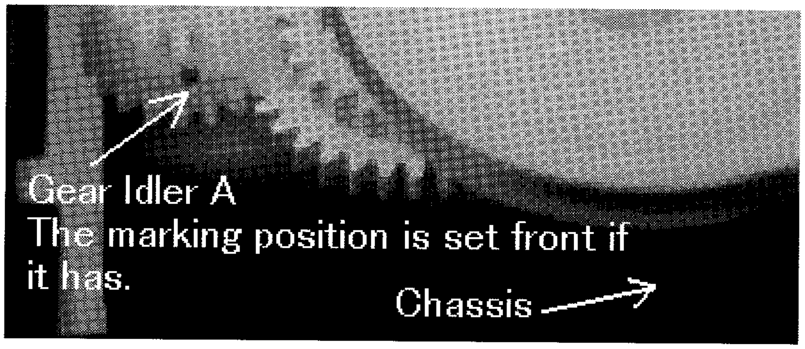

Gear Idler A
The marking position is set front if it has.
Chassis

Fig. 18

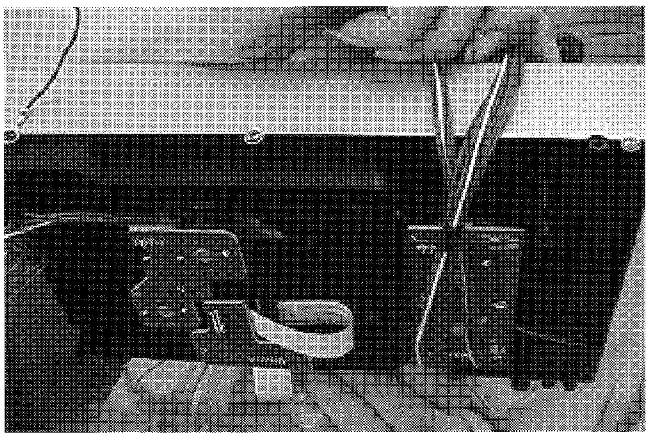


Fig. 19

TUNER ADJUSTMENT PROCEDUREES

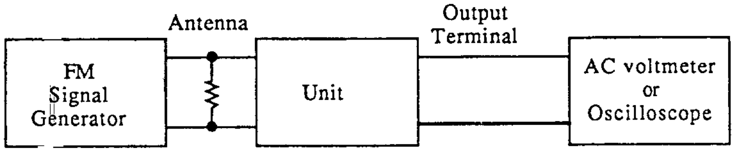
Preparation

1. Input
FM mono: 1kHz, 75kHz devi., 60dB/μ V
FM stereo: 1kHz, 67.5kHz devi., 60dB/μ V
Pilot signal 19kHz 7.5kHz devi.

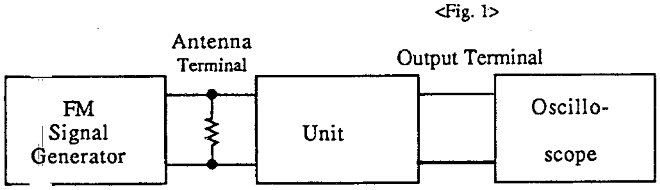
2. Outputs
Connect the non-inductive type resistor of 8 ohms to the all speaker terminals unless otherwise noted.

FM ADJUSTMENT

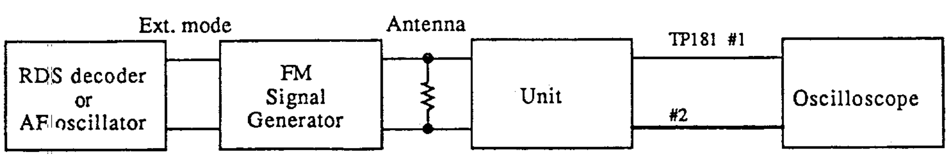
Item	Connection of instrument	FM SG output	Stereo modulator output	Tuning frequency	Output indicator	Adjustment point	Adjust for	Remarks
FM RF	Fig.1	99.0MHz 1kHz 75kHz devi. 65dBf(60dB)	———	99.0MHz	AC voltmeter	IFT on the front end	Maximum	FM MUTE/MODE switch:MONO
Muting Level	Fig.2	99.0MHz 19.2dBf(14dB)	———	99.0MHz	Oscilloscope	R101	Signal output	FM MUTE/MODE switch:AUTO
RDS	Fig.3	99.0MHz Ext. mod.60dB	RDS data or 57kHz 3% devi.	99.0MHz	Oscilloscope	R181	Maximum	



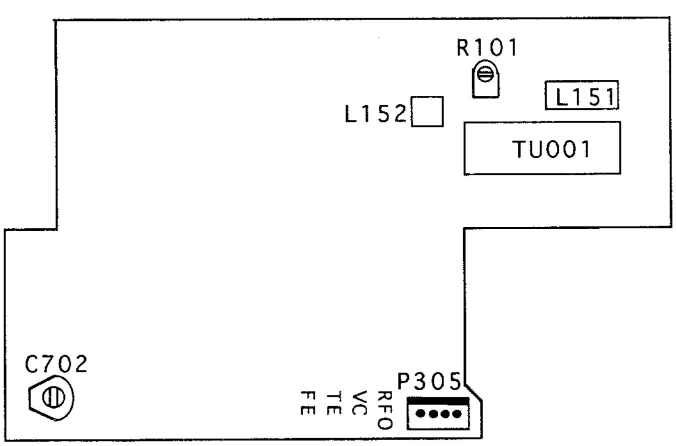
<Fig. 1>



<Fig. 2>



<Fig. 3>



TEST POINTS

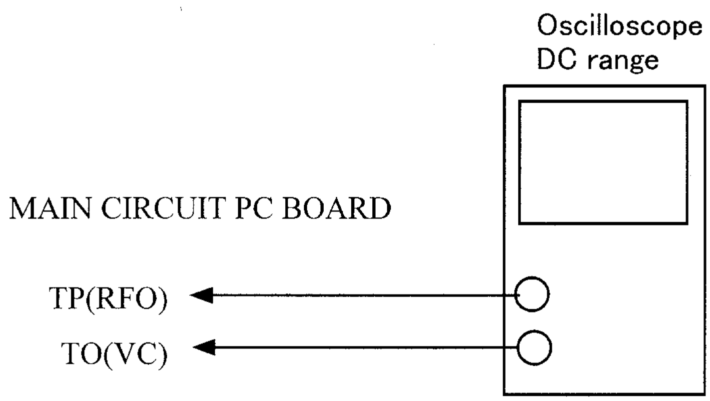
CD ADJUSTMENT PROCEDUREES

Clock Frequency Adjustment
1. Connect to P701 of frequency counter.
2. Press and hold the DOWN button, then press the DISC-3 (OPEN/CLOSE) button.
3. Adjust trimmer (C702) so that the frequency counter to 524.288kHz±1Hz.

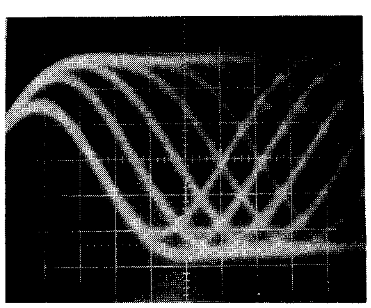
Confirmation of Jitter
1. Connect the jitter meter to pin 3(VC) and pin 4 (RF0) of test point (P305).
2. Load the test disc (SONY TYPE-4) on the tray and play the track 2.
3. Confirm the jitter value is less then 10.5nsec.

Auto Adjustment
1. Press and hold the DOWN button, then press the DISC-2 (OPEN/CLOSE) button.
2. Insert disc-1 (YEDS-18) and press >play button.
3. Connect the oscilloscope to pin 3(VC) and pin 2 (TE) of test point (P305).
4. Press play button.
5. Confirm that the center of tracking error signal on the oscilloscope becomes GND level.

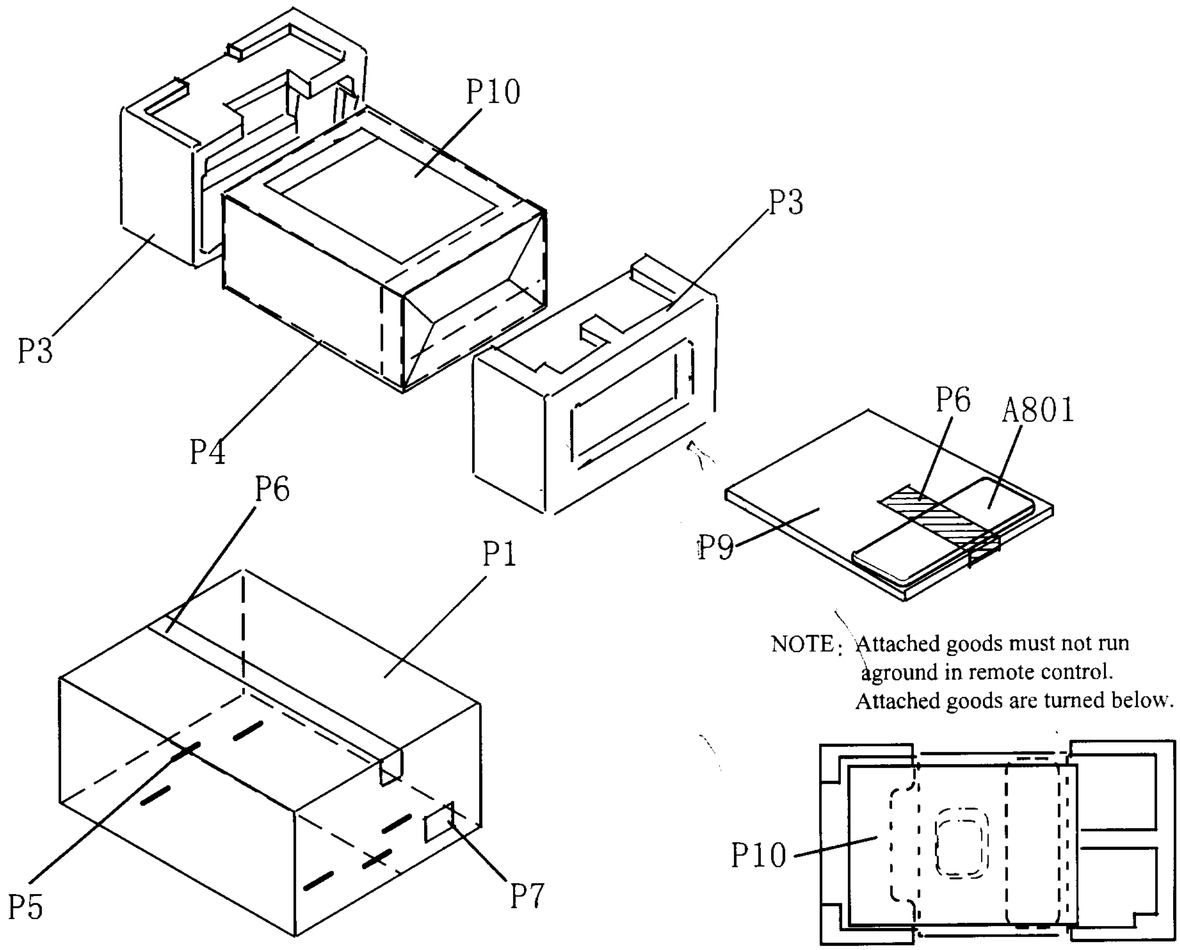
Confirmation of RF level
It is not necessary to perform the adjustment of optical pickup.
This confirmation should be made when replacing the optical pickup.
1).Connect the oscilloscope to test points RFO and VC.



2).Turn the power switch on.
3).Load the test disc YEDS-18 on the tray and press the play button.
4).Confirm that the waveform on the oscilloscope is optimum eye pattern and optimum level as shown photo 1.
Optimum eye pattern means that shape "◇" can be clearly distinguished at the center of the waveform.



PACKING VIEW



NOTE: Attached goods must not run aground in remote control.
Attached goods are turned below.

PACKING VIEW PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
P1	29053344A	Carton box <P>
P1	29053370A	Carton box <D>
P2,P3	29091771B	Pad
P4	29100123C	430*550,Styrene bag
P5	282321	Staple
P6	29110071	PP tape
P7	29362353	Label EAN <P>
P7	29362379	Label UPC <D>
P9	29095839	SHEET
A801	24140332B	RC-332S,Remote controller
P10	29100097-1A	350*250,Styrene bag
P10	25065462	YAE21-0237,FM antenna terminal
P10	292116	FM antenna

REF. NO.	PART NO.	DESCRIPTION
P10	29342628	Instruction manual
P10	29342629	Instruction manual FSI <P>
P10	29342630	Instruction manual GSWD <P>
P10	29358002K	Service station list <D>
P10	29365019B	Warranty card <D>
P10	3010054	UM-3,Battery
P10	29355133A	Label DBP <P>
	262002	Adhesive tape
	261504	Paper tape

NOTE: <P> 230V model only
<D> 120V model only

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